

-INCH-POUND
ATPD-2373
6 April 2007

PURCHASE DESCRIPTION

MINE PROTECTED CLEARANCE VEHICLE

1. SCOPE

1.1 Scope. This specification covers the performance and system requirements and delivery of a complete motorized, wheeled, blast protected system that is designed for ballistic and mine protection. The MPCV shall be a vehicle of a V-shaped hull design that is highly mobile, armor protected for ballistic and blast mine threats, have an articulating arm with a digging/lifting attachment and camera to remotely interrogate suspected explosive hazards, if necessary, move explosive hazards to the side, be capable of mounting and powering communications and counter electronic warfare equipment, and capable of transporting a payload as specified in the classified addenda to this purchase description.

1.1.1 System Overview. The MPCV is a blast protected vehicle that will operate in explosive hazardous environments to conduct route clearance operations. The system will have an articulating arm with a digging/lifting attachment and camera to remotely interrogate a suspected explosive hazard and allow the crew to confirm, deny, and/or classify the explosive hazard. The articulating arm and attachment can be used to move explosive hazards to the side of routes. It will provide a blast protected platform to transport Soldiers and to allow Soldiers to dismount in order to neutralize and/or mark explosive hazards. The MPCV complements the Vehicle Mounted Mine Detection (VMMD) and Medium Mine Protected Vehicle (MMPV) during route clearance operations. The MPCV will be organic to the Clearance Company in support of the Engineer Brigade, Combat Support Brigade (Maneuver Enhancement), or Brigade Combat Team.

1.2 Classification. The vehicles will be of the following classifications, as specified (see 6.2).

1.2.1 Type. The vehicles will be of the following types:

Type I – MPCV Engineering Variant

1.2.2 Class – The class of the vehicle shall be calculated in accordance with STANAG 2021

1.2.3 Crew – Number of seats.

1.2.4 Model – Wheels and wheels driving. Ex. 6x6

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of the specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements in the documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments, suggestions, or questions on this document should be addressed to U.S. Army Tank-automotive and Armaments Command, 6501 E. 11 Mile Road, Warren, MI 48397-5000 or emailed to standardization@tacom.army.mil.

AMSC N/A

FSC 2320

Distribution Statement: Approved for Public Release: Distribution is unlimited.

2.2 Government documents

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein/as applicable. Unless otherwise specified, the issues are those in effect on the date of the solicitation.

SPECIFICATIONS

FEDERAL

- FED-STD-376 – Preferred Metric Units for General Use by the Federal Government
- FED-STD-595 – Colors, Used in Government Procurement
- A-A-393 – Extinguisher, Fire, Dry Chemical (Hand Portable)
- A-A-50271 – Plate, Identification
- A-A-52426 – Hose and Hose Assemblies, Non-Metallic, Silicone, Polyester and Wire Reinforced
- A-A-52513 – Bracket Assembly, Liquid Container, Five Gallon
- A-A-52550 – Pintle Assembly, Towing, Manual Release, 18000, 40000 and 100000 LB Capacity
- A-A-52624 – Antifreeze, Multi-Engine Type
- A-A-59592 – Can, Fuel, Military: 20-Liter Capacity

DEPARTMENT OF DEFENSE

- MIL-STD-130 – Identification Marking of U.S. Military Property
- MIL-STD-188-125-2 – High-Altitude Electromagnetic Pulse (HEMP) Protection for Ground Based C4I Facilities Performing Critical, Time-Urgent Missions - Part 2 - Transportable Systems
- MIL-STD-209 – Interface Standard for Lifting and Tiedown Provisions
- MIL-STD-461 – Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
- MIL-STD-464 – Electromagnetic Environmental Effects Requirements for Systems
- MIL-STD-810 – Environmental Test Methods and Engineering Guidelines
- MIL-STD-1275 – Characteristics for 24 Volt DC Electrical Systems in Military Vehicles
- MIL-STD-1179 – Lamp, Reflectors and Associated Signaling Equipment for Military Vehicles
- MIL-STD-1180 – Safety Standards for Military Ground Vehicles
- MIL-STD-1366 – Interface Standards for Transportability Criteria
- MIL-STD-1472 – Human Engineering
- MIL-STD-1472F – Department of Defense Design Criteria Standard Human Engineering
- MIL-STD-1474 – Noise Limits
- MIL-DTL-53072 – Chemical Agent Resistance Coating (CARC) System Application Procedures and Quality Control Inspection
- MIL-DTL-83133E – Turbine Fuel, Aviation, Kerosene Types, NATO F-34 (JP-8), NATO F-35, and JP-8+100
- MIL-PRF-11021 – Switch, Vehicular Lights: 24 Volt DC
- MIL-PRF-2104 – Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
- MS75020 – Connector, Plug, Electrical-12 Contact, Intervehicular, 28 Volt

- MIL-PRF-62048 – Air Cleaners
- MIL-STD-643 – Identification Markings for Combat and Tactical Vehicles
- TOP 2-2-608 – Braking, Wheeled Vehicles

HANDBOOK

DEPARTMENT OF DEFENSE

- MIL-HDBK-759 – Human Engineering Design Guidelines
- MIL-HDBK-1791 – Designing for Internal Aerial Delivery in Fixed Wing Aircraft

INSTRUCTION

DEPARTMENT OF DEFENSE

- DoDI 6055.11 – Protection of DoD Personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers
Available - <http://www.dtic.mil/whs/directives/corres/html/605511.htm>

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins, Philadelphia, PA 19111-5094 or at <http://assist.daps.dla.mil/online/start/>).

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those in effect on the date of the solicitation.

CODE OF FEDERAL REGULATIONS

29 CFR Occupational Safety and Health Standard (OSHA)

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office Washington D.C. 20402, or at <http://www.osha.gov/>).

U.S. Army TACOM

- 12322663 – Towbar, Motor Vehicle
- 13229E8014 – Rifle Mounting Bracket
- 13229E8016 – Rifle Mounting Bracket
- 12422685 – Digitalization Rack, FMTV
- ATPD-2206 – Batteries, Storage: Lead-acid, "Maintenance Free" (Metric)
- ATPD 2352 – Purchase Specification, Transparent Armor
- REPORT CR-82-588-003 Rev 1, Feb 1988 – Design Guide for Vehicle Diagnostic Connector Assemblies
- TACOM Ground Combat Vehicle Welding Code
- Decontamination Kit Drawings and Designs
- Chemical Agent Detection Alarm Kit Drawings and Designs

ARMY REGULATIONS

- AR 750-1 – Army Materiel Maintenance Policy and Retail Maintenance Operations

DEPARTMENT OF TRANSPORTATION (DoT)

- FMVSS 121 – Air Brake Systems
FMVSS 207 – Seating Systems
FMVSS 302 – Flammability of Interior Materials

Federal Motor Vehicle Safety Standards (FMVSS) available at
www.access.gpo.gov/nara/cfr/waisidx_00/49cfr571_00.html

FMSCR 393.27 through 393.33

Federal Motor Carrier Safety Regulations (FMCSR) available at
http://www.access.gpo.gov/nara/cfr/waisidx_00/49cfr393_00.html

(Unless otherwise indicated, copies of the above documents and drawings are available from the Superintendent of Documents, U.S. Government Printing Office, 732 N. Capitol Street, NW, Washington, DC 20401, or at www.access.gpo.gov).

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those in effect on the date of the solicitation.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- AWS D1.1 – Structural Welding Code – Steel
Z535.1 – Safety Color Code
Z535.3 – Criteria for Safety Symbols

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018, or at <http://www.ansi.org/>).

ASSOCIATION OF AMERICAN RAILROADS (AAR)

General Rules Governing the Loading of Commodities on Open-Top Cars

(Application for copies should be addressed to IRF, 525 School St., Washington, D.C. 20024, or to www.aar.org/).

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

- ISO 2631 – Mechanical vibration and shock - Evaluation of human exposure to whole- body vibration

(Application for copies should be addressed to Case Postale 56, Geneva, Switzerland CH-1211, or www.iso.org/).

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

- NEMA Z535.2 – Environmental and Facility Safety Signs

(Application for copies should be addressed to the National Electrical Manufacturers Association, 1300 N. 17th Street, Suite 1847, Rosslyn, VA 22209, or www.nema.org/).

NORTH ATLANTIC TREATY ORGANIZATION (NATO) STANDARDIZATION AGREEMENT (STANAG)

- NATO-AEP-7 – Nuclear, Biological, and Chemical (NBC) Defense Factors in the Design, Testing and Acceptance of Military Equipment
- STANAG 2010 – Military Load Classification Markings
- STANAG 2021 – Military Computation of Bridge, Ferry, Raft, and Vehicle Classifications
- STANAG 4007 – Electrical Connection Between Prime Mover and Trailers
- STANAG 4074 – Auxiliary Power Unit Connections for Starting Tactical Land Vehicles
- STANAG-4381 – Blackout Lighting Systems for Tactical Land Vehicles
- STANAG 4569 – Protection Levels for Occupants of Logistic and Light Armored Vehicles

(NOTE: Application for copies of this STANAG should be addressed to Etat-Major de la Force, Terrestre, GSPR OPS TRG, Quartier Reine Elisabeth, Evere, Brussels, Belgique, or www.nato.int/).

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

- SAE J110 – Automotive and Off-highway Air Brake Reservoir Performance and Identification Requirements
- SAE J115 – Safety Signs
- SAE J163 – Low Tension Wiring and Cable Terminals and Splice Clips
- SAE J198 – Windshield Wiper Systems, Trucks, Buses, and Multipurpose Vehicles
- SAE J318 – Automotive Air Brake Line Couplers (Gladhands), Recommended Practice
- SAE J336 – Sound Level for Truck Cab Interior
- SAE J343 – Test and Test Procedures for hydraulic hoses and assemblies
- SAE J366 – Exterior Sound Level for Heavy Trucks and Buses
- SAE J381 – Windshield Defrosting Systems Test Procedure and Performance Requirements – Trucks, Buses, and Multipurpose Vehicles
- SAE J382 – Windshield Defrosting Systems Performance Requirements - Trucks, Buses, and Multipurpose Vehicles, Recommended Practice
- SAE J516 – Hydraulic Hose Fittings
- SAE J517 – Hydraulic Hose
- SAE J534 – Lubrication Fittings
- SAE J537 – Storage Batteries
- SAE J551-1 – Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats
- SAE J551-11 – Vehicle Electromagnetic Immunity - Off-Vehicle Source
- SAE J578 – Color specification
- SAE J591 – Spot Lamps
- SAE J645 – Automotive Transmission Terminology
- SAE J680 – Location and Operation of Instruments and Controls in Motor Truck Cabs, Recommended Practice
- SAE J695 – Turning Ability and Off Tracking – Motor Vehicles

SAE J704	–	Openings for Six- and Eight-Bolt Truck Transmission Mounted Power Take-Offs
SAE J753	–	Maintenance Interval Chart
SAE J985	–	Mirror, Design, Rear View, Vision Factors, Considerations In
SAE J994	–	Alarm – Backup – Electric Performance Testing
SAE J1013	–	Measurement of Whole Body Vibration of the Seated Operator of Off-Highway Work Machines
SAE J1127	–	Low Voltage Battery Cable
SAE J1128	–	Low Voltage Primary Cable
SAE J1292	–	Automobile, Truck, Truck-Tractor, Trailer, and Motor Coach Wiring, Recommended Practice
SAE J1383	–	Performance Requirements for Replaceable Bulb Motor Vehicle Headlamps
SAE J1587	–	Joint SAE/TMC Electronic Data Interchange between Microcomputer Systems in Heavy-Duty Vehicle Applications
SAE J1708	–	Serial Data Communications between Microcomputer Systems in Heavy-Duty Vehicle Applications, Recommended Practice
SAE J1839	–	Coarse Droplet Water/Fuel Separation Test Procedure
SAE J1939	–	Recommended Practice for a Serial Control and Communications Vehicle Network
SAE J2009	–	Discharge Forward Lighting System and Subsystems
SAE J2360	–	Oil, Lubricating, Gear, Multipurpose (Metric), Military Use
SAE J2580	–	Identification and Installation of Air Brake System Components

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096, or www.sae.org/).

TIRE AND RIM ASSOCIATION (TRA)

Tire and Rim Association Yearbook

(Application for copies should be addressed to the Tire and Rim Association, Inc., 3200 West Market Street, Akron, OH 44313, or <http://www.us-tra.org/>).

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First Article. When specified, a sample shall be subjected to first article test and inspection in accordance with 4.2

3.2 Physical Characteristics. The MPCV shall be an all wheel drive (see 3.11.1), blast protected (see 3.19), crew transport (see 3.12), and cargo hauling (see 3.14.2) vehicle with an articulating arm (see 3.13).

3.2.1 Materials. Materials shall be of sufficient durability to meet all performance requirements, in any of the environments, specified herein. The materials in the vehicle hull and armoring (transparent and opaque) of the MPCV shall be the same for all vehicles.

3.2.1.1 Hazardous Materials. Asbestos, radioactive materials, hexavalent chromium (electroplating and coatings), cadmium (electroplating), or other highly toxic or carcinogenic materials (as defined in 29 CFR 1910.1200) shall not be used in the manufacture or assembly of the {MPCV} without prior approval from the government. Class I and Class II Ozone Depleting Substances shall not be used. These requirements shall apply to any components/parts purchased through a subcontractor/vendor.

3.2.2 Rubber materials. Rubber products furnished, like tires and hoses, shall be manufactured from material less than four calendar quarters old, from the date of cure to date of manufacture. Rubber hose material shall be compatible with the type of fluids for which they are to be used

3.2.3 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements.

3.2.4 Dissimilar metals. Dissimilar metals shall not be used in immediate contact with each other unless protected against galvanic corrosion.

3.2.5 Deterioration prevention and control. The vehicle shall be fabricated from compatible materials, inherently corrosion resistant, or treated to provide protection against the various forms of corrosion and deterioration to which they are susceptible.

3.2.6 Finish. Shall be treated and painted in accordance with MIL-C-53072. Unless otherwise directed in the production order (See 6.2), the color shall be desert tan, color no. 33446 of FED-STD-595. Surfaces not suitable for painting shall be treated to or inherently provide a surface of minimal reflectivity, as shall interior components visible from the exterior. Lug nuts and wheel studs may remain unpainted but shall have a non-corrosive finish applied to them. Other internal components may be finished with the manufacturer's standard colors and paint, plating, or treatment. Non-skid material shall be applied to surfaces where operators and maintainers are likely to walk or stand.

3.2.7 Camouflage. When specified (see 6.2), the vehicle shall be finished in a Government approved camouflage pattern (see 6.4). It is the OEMs responsibility to provide the necessary data to obtain approval of the camouflage pattern.

3.3 Configuration. Powertrain components shall be compatible with and properly matched to all driven mechanisms simultaneously. The vehicle structure shall be capable of withstanding the strain, vibration, and other detrimental effects incident to off road travel as described in Mobility (see 3.14.2) and conform to the performance requirements of 3.14. Whereas this specification cites inch-pound units, products made to metric equivalents are acceptable (see 6.7).

3.4 Components and Ratings. The MPCV shall be provided with all new parts and components. Fuel, air, and hydraulic lines shall be readily distinguishable and not have common or interchangeable couplings. All individual components, including but not limited to the engine, transmission, driveline, axles, suspension, and tires shall be common for all vehicles and shall be rated at or above the vehicle's gross vehicle weight rating. All vehicle ratings shall be the manufacturer's published ratings; individual component ratings shall not be arbitrarily raised to meet requirements.

3.4.1 Engine. The MPCV shall be supplied with an electronically controlled, liquid cooled diesel engine capable of the performance specified herein while operating primarily with aviation, kerosene type turbine fuel, grade JP-8 in accordance with MIL-DTL-83133. The engine shall also be capable of performing as specified herein while operating on diesel with sulfur content of up 3,000 ppm. The MPCV engine is neither subject to EPA Motor Vehicle Heavy Duty Diesel Exhaust emission standards,

nor the EPA Nonroad exhaust emission standards since the vehicle will contain permanent armor protection. This determination is IAW 40 CDR, Sections 85.1703, 89.908 and 1068.225. Pollution control technologies that are affected by the sulfur level of the JP-8 fuel either in maintenance or life expectancy shall not be used, e.g., Exhaust Gas Recirculation (EGR), NOX traps, catalytic converters, etc.

3.4.1.1 Engine air intake. The MPCV shall be provided with not less than one air cleaner that meets or exceeds the requirements of MIL-PRF-62048, and shall provide a minimum dust capacity sufficient for a 60 hour service life without removing and cleaning. The induction air ducts shall not require disassembly for normal vehicle maintenance or element servicing. An air cleaner restriction indicator, visible from the driver's seat, shall be provided. The restriction indicator shall retain and display the highest restriction level attained during vehicle operation. The indicator shall be resettable from inside the vehicle and shall retain the reading after the engine is shut off.

3.4.1.2 Dusty Conditions. If the OEM standard engine air intake is not able to meet the requirements of MIL-PRF-62048 with Arizona Test Dust (A1) per ISO 12103-1, A1, then at the government's direction the contractor shall provide a kit that will enable the vehicle to do so.

3.4.2 Cooling system. The cooling system shall be able to handle hot, dusty (very fine particulates, ISO 12103-1 A1) desert environments and be properly designed for sustaining temperatures resulting from towing operations as specified herein when operating in a steady state condition. The cooling system shall be capable of retention and recovery of 6% coolant overflow or have 6% expansion reserve capacity. The cooling system shall be capable of continuous de-aeration of 0.1 CFM of air per cylinder at rated engine speed at any slope the vehicle is required to operate on. The thermal conditions of the engine shall be monitored by a coolant temperature gauge that provides a constant readout at the operator's position. Initial fill of the cooling system shall be a mixture of 50 percent water and 50 percent antifreeze conforming to A-A-52624. The cooling system shall meet the following requirements:

- a. Maintain the specified component operating temperatures within the specified limits while operating continuously at full load and 0.6 tractive effort to gross vehicle weight ratio (TE/GVW) while under the maximum temperatures conditions specified herein.
- b. Does not exceed temperature limits while operating at rated engine power.
- c. Meets the requirements after a drawdown of 10% of engine coolant. Specified fluid temperatures shall not exceed the lower of those for which the component manufacturer shall provide warranty.

If the system is also used to maintain the temperature of the transmission, it shall do so without degradation of cooling to the engine, as described. If the cooling system fan is provided with a thermostatic control, in the event of its failure, the fan shall continue to operate while the engine does.

3.4.3 Lubricating Oil(s). All parts and components shall be compatible with specified military lubricants referenced in MIL-PRF-2104. Initial lubrication and all subsequent lubrication shall be compatible with military lubricant referenced in MIL-PRF-2104. Gear lubricating oil shall conform to SAE J2360. A lubrication data plate in accordance with SAE J753 shall be mounted on the MPCV and shall identify all lubricants and fluids (and Military equivalents) and the appropriate temperature ranges to be utilized when servicing the vehicle. The engine oil filter location shall be labeled, specifying filter type, and placed near the point of filter installation.

3.4.3.1 Hydraulic Fluid(s). All parts or components requiring hydraulic fluid shall meet the requirements in MIL-PRF-46170. The hydraulic fluid must contain a fire retardant.

3.4.4 Fuel tanks. The MPCV shall be provided with integral fuel tank(s) of a capacity that will permit a range of not less than 300 miles at an average speed as specified in the classified addenda to this

purchase description. It is desired that each fuel tank shall be supplied with a drain plug, at its lowest point, removable with common hand tools and without requiring removal of any other vehicle component. Manual shut-off valve(s) shall be furnished at the tank(s), on the fuel supply line before the fuel filter(s); labeled "FUEL SHUT-OFF", with double ended arrows indicating the direction of operation and the functional result (i.e. open, closed). Readily discernable at or on the fuel fill port, or its cap, "JP8/Diesel Fuel" shall be indelibly marked in letters not less than 1-inch high. Fuel tank ports must be a minimum of 2.25 inches inside diameter, and shall be compatible with Army and NATO dispensing nozzles having a nominal outside diameter of 2 inches. The fuel tanks shall be capable of accepting fuel at a rate of not less than 50 gallons per minute. The fuel fill port(s) shall be provided with removable strainers, and shall accept fuel from a 5-gallon can conforming to A-A-52513 or A-A-59592. Fill port(s) shall be supplied with captivated safety filler cap(s) made to preclude mud build-up and intrusion into the tank. A sealed cap and vent shall be furnished if the port is below fording depth (see 3.14.2.6). The fuel system design shall be such that fuel spilled during refueling will not contact any part of the exhaust or electrical system. The fuel system shall be protected to the same levels as specified in 3.19. An active or passive fire protection method is desired to allow safe egress of the crew and minimize fire damage to the vehicle when the fuel tanks are penetrated by an IED or other overmatching ballistic threat.

3.4.5 Exhaust system. The exhaust system shall be leak-proof and the point of exhaust shall be located so as not create a toxic or nausea hazard to the operator and crew while operating the vehicle or personnel performing maintenance tasks with the engine operating. The point of the exhaust shall also be located and directed so as to prevent the drawing of exhaust into the NBC unit (if applicable). The system shall also provide protection against burn hazards to personnel. The exhaust pipe(s) shall be configured or equipped to prevent entry of precipitation; and for naturally aspirated engines, furnished with a spark-arresting muffler, located away from the fuel system and any other flammable components. All components of the exhaust system shall be fabricated from inherently corrosion resistant materials such as stainless steel. Aluminized steel shall not be used in the exhaust system.

3.4.6 Transmission. The MPCV shall be equipped with an automatic transmission (as defined by SAE J645) and meet the requirements of 102.1 of MIL-STD-1180. The automatic transmission shall be electronically controlled, shall have a downshift inhibitor, and shall preclude inadvertent reversal of vehicle direction. Shifting controls shall be of the dash mounted, push-button type. The transmission shall have a power take off opening meeting the requirements of SAE J704. Optimization of automotive performance through electronic interfacing of at least the transmission and engine is desired.

3.4.7 Electrical system. The MPCV shall be equipped with a 12 and/or 24 volt, waterproof (per fording requirements, 3.14.2.6) electrical system. Electrical system shall be in accordance with FMCSR 393.27 through 393.33. An auxiliary power unit, defined as a compact starter-generator (or electric induction motor) mounted between the engine and transmission in the transmission bell housing, or in a similar mounting location, can be used. The 24 volt D.C. electric power circuits shall conform to the MIL-STD-1275. Reverse polarity protection shall be incorporated in the system. Each circuit shall be protected by a circuit breaker or fuses, with labels (or other coding) indicating the function served by the circuit. The enclosure for the circuit breakers or fuse box(es) shall be inside the crew compartment of the vehicle. All circuit breakers shall be a manual-resetting type and shall be readily accessible. Spare fuses, if fuses are used, in each amperage rating used on the vehicle, shall be present and located on the fuse panel. The ability (space claim) and design flexibility to expand or enhance the electrical system (i.e. add additional fuse boxes, add circuits, etc.) is desired. A wiring harness and connector is desired, to mate the vehicle with the electrical system on a towed vehicle. The connector is desired to mate with military connectors in accordance with MS75020; be furnished with a spring-loaded cover; and labeled "TRAILER CONNECTOR" (see 3.20). All connectors and switches shall be protected from adverse effects of the elements. There needs to be two (2) exterior outlets (front and rear of vehicle) for man-

portable worklamp (BII) to conduct PMCS, etc. at night. Circuit panel, breakers and fuses need to be inside the vehicle and accessible by operator in order not to expose themselves outside the vehicle.

3.4.7.1 Alternator and Regulator. The MPCV shall be equipped with a minimum 400 amp, 12 &/or 24 volt DC radio suppressed alternator, which shall provide sufficient current to operate all electrical components (lighting; all command, control, communication, computer, information, surveillance and reconnaissance (C4ISR) equipment; electronic countermeasures (ECM) equipment (when required); and charge the batteries), when engine is operating at idle speed. The alternator shall be configured to prevent internal alternator corrosion during its expected normal service life. The ability (allocated space claim) and design flexibility to switch to a larger alternator or add an additional alternator is desired and will be evaluated as a significant strength to the proposal. The MPCV shall be equipped with a voltage charging system. The voltage control system must be capable of maintaining battery equalization and battery balance when batteries are unmatched or in the same state of charge and provide for separate voltage regulation for the batteries of each voltage system.

3.4.7.2 Starter. Starter protection shall prevent re-engagement of the starter with the engine running. The starter must be capable of re-engaging within two seconds (maximum) after the engine is stopped. The starter shall be sufficiently sealed and/or its mounting housing sufficiently vented to prevent starter corrosion.

3.5 Slaving components. The vehicle shall be equipped with (at minimum) two 24-volt slave receptacles that shall mate with connectors conforming to NATO STANAG-4074, Type I. The receptacle shall permit charging of the batteries and slave starting of the engine from an external power source; and provide a power source for charging and slaving other equipment. The slave receptacle shall be installed on the exterior of the vehicle with a protective cover, accessible to personnel standing on the ground and placed near the front and rear of the vehicle. The slave receptacle shall be labeled "SLAVE, 24 VOLTS" (see 3.20).

3.6 Lighting. In addition to individual controls, the vehicle shall be equipped with a master switch to control headlights, blackout lights, and instrument panel lights. All lights shall be controlled by a master switch from the crew compartment conforming to MIL-PRF-11021. Where appropriate, LED lighting which has lower electrical power requirements, increased durability, and longer lifetimes is preferred to incandescent or fluorescent lighting. The vehicle shall be equipped with turn signals, backup lights, and emergency flashers. Emergency flashers, when activated, shall be overridden by the brake lights when the brakes are applied. License plate lamps are not permitted.

3.6.1 Headlights. Vehicle headlights and wiring shall be in accordance with requirement 108.1 of MIL-STD-1179. Headlights shall be mounted in a protected location. The rated luminous flux at the rated wattage of each headlight shall be a minimum of 3200 lumens when tested to SAE J2009. The color of light emitted from the headlights shall fall within the "white" light chromaticity boundaries as defined in SAE J578 following seasoning and after attaining steady state. Each headlight shall be rated at a minimum luminance of 6400 candela per square centimeter as measured to SAE J1383 at nominal voltage. The headlights shall meet the photometry requirements at minimum and maximum voltage range for stabilized light output, as specified by the manufacturer.

3.6.2 Blackout lights. The MPCV shall be equipped with the following, conforming to STANAG 4381:

- a. One left front headlight. The blackout headlight shall be mounted on the left front of the plan outline of the vehicle. The blackout front marker lights shall be mounted on the front of the vehicle, as far apart as practical, one each side of the vertical centerline at the same level.
- b. Two front marker lights.

- c. Two rear stop/marker/taillights. The blackout taillights shall be mounted in a protected location, recessed not less than ½-inch into hole or behind the guard.

Blackout lights shall be operated by an interior switch conforming to MIL-PRF-11021. All interior and external lights except crew lighting (see 3.6.4), the horn, and the backup alarm shall be made inoperable when blackout lights are used except for warning lights. The warning lights, such as temperature and oil lights, shall remain operative in the blackout mode, but shall automatically switch to blackout or low visibility mode to be compatible with night-vision equipment.

3.6.3 Interior lighting. The vehicle shall be equipped with instrument lighting and indicators, are easily read and understandable to the operator and crew. Intensity of instrument and gauge lighting shall be adjustable. Interior lights, gauges and instruments, to include warning lights, shall not emit energy outside of the 380-700 nanometer wavelength range while in blackout mode. Desired that the color coding of illuminated instruments shall conform with paragraph 5.2.2.1.13 of MIL-STD-1472.

3.6.4 Crew lighting. Overhead dome lights shall be provided in the crew area with cab area controls and individual on/off switches for each light. The dome lights shall be equipped with both white and military blackout lights. The dome lights shall be able to be switched manually from white to military blackout and shall switch automatically from white to military blackout when any door to the vehicle is opened.

3.6.5 Spotlights. A minimum of one, remotely adjustable/aimed, spotlight shall be provided in accordance with the classified addenda to this purchase description.

3.6.5.1 Exterior Area Lighting. Exterior scene lighting shall be provided in accordance with the classified addenda to this purchase description.

3.7 Wiring. Weatherproof wire and connector assemblies shall be in accordance with SAE J1128/J163. Wiring, including numbering, shall be in accordance with SAE J1292; and routed in a protected location.

3.7.1 Wiring Gauge. The wiring gauge shall be compatible with a 400 amp alternator.

3.8 Battery. The battery(s) shall be of sufficient size to start vehicle at all environmental conditions specified herein. The batteries shall have a total reserve capacity rating of not less than 480 minutes and the total cold cranking rating shall be not less than 2450 amperes, when measured in accordance with SAE J537. Battery cables conforming to SAE J1127 shall be furnished with insulated terminal covers. Positive and negative cable terminals shall be identified with a red sleeve, labeled "+" and a black sleeve, labeled "-", respectively. Maintenance free batteries are required. A battery disconnect switch shall be provided for all batteries. The disconnect switch shall not be readily accessible from the ground.

3.8.1 Battery mounting. The battery shall be mounted above fording depth (see 3.14.2.6) and be accessible for removal and service without requiring removal of components other than a cover, if one is provided. Battery mounting shall not interfere with access to components; and shall support the entire battery base. Battery restraining clamps shall be provided to hold the battery in a fixed position. The battery compartment shall have provisions for drainage and venting, and shall be protected against corrosion and short-circuiting.

3.9 Platform Diagnostic Capabilities. The MPCV shall have at-platform diagnostics IAW 3.9.1 or embedded diagnostics IAW 3.9.2 when Line Replacement Unit (LRU) fault isolation capability is

equivalent or greater than sections 3.9.1. In addition when practical, the MPCV shall have the diagnostic ability to identify major system LRU failures (e.g. check engine lights, blinking/flashing lights etc.).

3.9.1 Electronic. The MPCV must be compatible with current U.S. Army Standard Unit Level Test Equipment which is presently the MSD (Maintenance Support Device). Diagnostic connectors and circuits must be compatible with current standard Army test equipment. Diagnostic connectors shall be easily accessible, hard mounted and environmentally protected. The diagnostic connectors shall be equipped with a cover, which shall prevent entrance of moisture and contaminants.

The MPCV shall feature either a single data bus network as specified by SAE J1939, J1708, or a multiple data bus network in accordance with J1939, which defines the interface between J1708 and J1939. The MPCV data bus shall have built in sensors that provide fault isolation capability sufficient to identify failures of major components of each system monitored by the data bus. Diagnostic outputs shall be transmitted to the vehicle mounted J1939 female 9 pin Deutsch Connector, which shall conform to SAE J1939-13 'Off-board Diagnostic Connector' dated July 1999. Software required to interface, retrieve, and interpret vehicle system's diagnostic data shall be provided to the government. Software shall be capable of displaying operator/ driver informational data associated with each error code.

3.9.2 Embedded diagnostics. The MPCV shall have an on-board display screen capable of retrieving and interpreting diagnostic error codes of major components of each system monitored by the data bus. The MPCV shall feature either a single data bus network as specified by SAE J1939, J1708, or a multiple data bus network in accordance with J1939, which defines the interface between J1708 and J1939. The MPCV data bus shall have built in sensors that provide fault isolation capability sufficient to identify failures of major components of each system monitored by the data bus. Software required to interface, retrieve, and interpret vehicle system's diagnostic data shall be provided to the government. Software will also be capable of displaying operator / driver informational data associated with each error code. Software will be capable of performing a self-test of its self.

3.10 Reserved.

3.11 Vehicle hull or Chassis. The vehicle hull or chassis and related subsystems shall be of sufficient durability and strength to withstand the stresses imposed in any of the operations intended to be performed by the vehicle; and by its deployment.

3.11.1 Axles. All axles shall be powered. An inter-axle differential shall be provided. The wheel offset shall be the same on all axles to allow interchangeability of wheel assemblies. All axles shall be properly vented and equipped with lubricated wheel bearings and seals adequate to meet fording requirement (see 3.14.2.6). If tandem rear axles are provided, as much as feasible, the rear axles, differentials, and other components shall be interchangeable, between the two tandem axles. All axles need to be designed to handle the gross vehicle weight at a minimum.

3.11.2 Torque limiting differentials. Traction control or positive direct drive to each wheel, with minimum effect to vehicle steering, shall be provided. If a full locking traction control device is utilized, it shall be capable of being implemented without stopping the vehicle. If traction control is operator controlled, a warning light shall be installed and labeled in a position clearly visible to the operator that shall be illuminated when engaged.

3.11.3 Suspension. Damping shall be provided at all wheels.

3.11.4 Tires and Wheels. The vehicle shall be equipped with single tire and wheel assemblies on each axle. The wheels shall be of a single-piece or bolt-together type construction, and conform to Tire

and Rim Association recommendations for the type and size of tire furnished. All tire and wheel assemblies shall be balanced; and be identical. Tires and wheels shall meet requirements 119.1 and 120.1 of MIL STD 1180. The vehicle shall be equipped with on-off road non-directional tread, tubeless, radial tires, with ratings conforming to Tire and Rim Association recommendations for the type and size of tire. Ballast or hydro-inflation of tires is not permissible. Run-flat inserts are required which shall allow the MPCV to travel not less than 30 miles at not less than 30 mph on a hard surface road (threshold / trails and cross-country terrain objective) after complete loss of air pressure in any two tires. A spare tire and wheel assembly identical to those provided on the axles shall be furnished, and provided with the vehicle. The vehicle shall be equipped with a lifting system capable of lowering spare tires and lifting spare/damaged tires into place for movement. The vehicle shall be equipped with a tire jack that is capable of safely lifting each wheel/tire individually high enough to change the wheel and tire with vehicle loaded at GVW. It is desired to have the jack system built into the vehicle.

3.11.4.1 Wheel splash and stone throw protection. Anti-sail, flexible, mud flaps shall be provided to preclude mud and debris from being thrown onto mirrors, the vehicle body, and lights. Mud flaps shall be mounted to react passively in turning situations, preventing damage to towed equipment and minimizing damage to flaps. They shall be removable using only onboard hand tools.

3.11.5 Service brakes. Vehicle shall be provided with full air brakes equipped with an anti-lock braking system (ABS) that conform to FMVSS 121. Brakes shall be furnished on all wheels. Pedal size(s) shall meet the separation, resistance, and displacement requirements of MIL-STD-1472F.

3.11.5.1 Air system. The following shall be required:

- a. Air compressor, engine driven and engine lubricated, air or water cooled, capable of not less than 12 cfm at 120 pounds per square inch.
- b. Shall be provided with external connections for powering air tools.
- c. Air storage reservoir(s), each tank equipped with drain, and with safety and check valves between the compressor and the last reservoir tank.
- d. Air control valves.
- e. Air pressure gage, visible to the driver.
- f. Low air pressure warning, visible and audible.
- g. Service brake stop lamp switch.
- h. Automatic moisture ejector/evaporator.
- i. Air brake service and emergency line couplings conforming to SAE J318 in the front and rear of vehicle.

3.11.5.2 Trailer brakes. In addition to the components specified above, a complete trailer brake control system is desired to be furnished that includes, but is not limited to, the following:

- a. Trailer stoplight operative with foot control and with control for trailer brakes.
- b. An interconnection to mate with the electrical system on the towed trailer.
- c. An interconnection for air service to the trailer brakes.
- d. Emergency and service lines, and connectors identified per SAE J2580.

3.11.5.3 Increased braking ability. Desired that an engine retarder be furnished which uses engine compression to assist dynamic braking. Dash board activation for this system shall be provided.

3.11.5.4 Parking brake. A parking brake system shall be furnished that shall conform to requirement 105.1 or 121.1 of MIL-STD-1180; except that it shall hold on a 20 percent grade (threshold / 30 percent objective), pointing either up or down hill. The force required by the operator to apply parking brakes as described above shall not be greater than 24 pounds for hand actuated parking brakes, and 57 pounds for foot actuated parking brakes.

3.12 Crew compartment. The vehicle shall be equipped with a waterproofed to the extent specified in 4.5.8.4, insulated, rigid crew compartment. The crew compartment shall be capable of being operated by two Soldiers (one driver and one interrogation arm operator/co-driver) and transportable for an additional four Soldiers including all of the Soldiers individual equipment and weapons. Crew compartment design shall conform to requirement 302.1 of MIL-STD-1180.

3.12.1 Seating. All vehicles shall be equipped with one seat per occupant with all seating systems, seatbelts, and seatbelt assemblies and anchorages that meets FMVSS 207, 209, 210 and 302. All seats shall be forward facing. Seats shall be equipped with restraint systems/harnesses with a single point quick release feature, capable of restraining a 5th percentile without battle gear to a 95th percentile male in full battle gear. Seats should be cushioned to improve shock absorption from mine blast impacts. Seatbelts shall be accessible to the occupants at all times, unless purposely stored. Forward seats shall provide head supports, to control head movement. The aisle between the seats shall not be less than 20 inches (29 inches, preferred), per guidance from MIL-HDBK-759.

3.12.2 Operator's seat.

3.12.2.1 Driver's seat. The driver's seat shall be adjustable; fore and aft and up and down, both armrest and backrest, and located to provide maximum unobstructed visibility for the driver.

3.12.2.2 Interrogation Arm seat. The interrogation Arm seat shall be adjustable; fore and aft, both armrest and backrest, and located to provide maximum unobstructed visibility for the co-driver.

3.12.3 Glass. The windshield and automotive glass provided with the MPCV shall meet or exceed the force protection and system survivability requirements (see 3.19 and 3.20) and shall be water white/un-tinted. Glass meeting or exceeding all requirements of the "Purchase Specification, Transparent Armor; ATPD 2352", for the offered threat level is an objective. If NVG compatible glass is not utilized the vehicle shall be capable of hosting the Driver's Vision Enhancer (DVE). Automatic or manual windshield wiping and washing system conforming to SAE J198 and requirement 104.1 of MIL-STD-1180 on side windows being individually operated are desired.

3.12.4 Ventilation System. The MPCV shall be equipped with a heating and ventilation system allowing fresh and recycled air to be circulated in the crew compartment. An air conditioning kit is allowable to meet this requirement. The heating and ventilation system shall meet the requirements of 5.12.6 of MIL-STD-1472F. The air shall be dust and dirt filtered. Filters shall be readily accessible for ease of changing. The MPCV shall be capable of reaching and maintaining an internal temperature of between 65°F and 80°F within 60 minutes after the heater or air conditioner is turned on when outside temperatures are between -25°F and 135°F. The MPCV ventilation system shall also have defrosting/defogging capability. Ducting shall be routed throughout the crew compartment with a register provided to each crew member as specified by MIL-STD 1472F, para. 5.12.6.2. Temperatures will be maintained at communication rack and crew seating areas while all doors, windows, and hatches are closed.

3.12.5 Ingress/Egress Points. The MPCV shall be equipped with a minimum of 7 access points (doors/hatches). All doors shall be capable of being locked. Steps shall be provided to access doors as required. Rear door width shall allow egress of a fully equipped soldier. Rear door access steps will allow individuals 5th percentile - 95th percentile to safely egress the rear of the vehicle while dressed in full combat gear and MOPP IV gear. Roof hatches must have locking mechanisms that will keep them opened or closed while operating in rough terrain.

3.12.5.1 Emergency Egress. The MPCV shall be equipped with egress points to allow all six occupants to quickly exit the vehicle. In the case of emergency, two access points (front and rear) need to have the capability of being opened from the outside of the vehicle.

3.12.6 Storage. The MPCV shall be equipped with the following space to stow and carry equipment.

3.12.6.1 Internal Storage. The MPCV shall be equipped with a minimum internal storage space of 100 cubic feet.

3.12.6.2 External storage. The MPCV shall be equipped with two bussel racks and one BII storage box on the side of the vehicle for exterior storage.

3.12.7 Towing Points (Tow Bar). The MPCV shall be supportable with existing standard Army and USMC towing and recovery systems and equipment, including the M88A2 Recovery Vehicle, the M984A1 HEMTT Wrecker and the Logistics Vehicle System (LVS) Rear Body Unit (RBU), Wrecker/Recovery, MK15/15A1 MOD 0 for flat and lift towing. The vehicles shall be equipped with towing eyes IAW STANAG 4019. It is desired that the vehicle be equipped with an electrical connector near the aft mounted tow pintle for trailer lights. A swivel type, towing pintle in accordance with A-A-52550, Type II shall be provided at the front and rear of the vehicle. It shall be mounted, with provisions for the attachment of trailer safety chains.

3.12.8 Reserved.

3.12.9 Gauges and instruments. Gauges and instruments/controls shall be arranged in compliance with SAE J680, identified according to function and meet requirement 101.1 of MIL-STD-1180. The vehicle shall be equipped with the following instruments and gauges, at a minimum, readily visible to the full range of military personnel, seated in the driver's seat:

- a. Voltmeter or ammeter.
- b. Fuel gauge.
- c. Engine oil pressure gauge.
- d. An engine oil low-pressure red indicator light or audible alarm.
- e. Engine coolant temperature.
- f. An engine high-temperature red indicator light or audible alarm
- g. A transmission high-temperature red indicator light or audible alarm.
- h. Air pressure gauge with an audible alarm to indicate low air pressure.
- i. Speedometer with odometer.
- j. Engine tachometer.
- k. Inclinator; gage to show lateral tilt angle
- l. Turn signal lights and emergency flashers
- m. Hydraulic gauge – PSI.
- n. Air filter indicator.
- o. Transmission fluid temperature.

Means shall be provided to check the operation of all (visible and audible) alarms. The oil low-pressure indicator or audible alarm may be common to that for the engine high temperature. All gauges need to be direct read analog. Desired that the color coding of illuminated instruments conform with paragraph 5.2.2.1.13 of MIL-STD-1472.

3.12.10 Cab accessories. The vehicle shall be equipped with the following accessories, at a minimum:

- a. Keyless ignition to start the vehicle.
- b. Multi-speed, windshield wiping and washing system conforming to SAE J198 and requirement 104.1 of MIL-STD-1180.
- c. Adjustable visors for both driver and passenger.
- d. Two exterior rearview mirrors. The mirrors shall meet requirement 111.1 of MIL-STD-1180, with shock dampening mounts and shall collapse against the cab upon impact.
- e. Ventilation system - Reference 3.11.6.4.

3.12.11 Communications equipment mounting provisions. The vehicle shall have sufficient allocated volume, electrical connections (i.e. power distribution center) with adequate power, and antenna conduit/wiring provisions for a communications rack capable of mounting military communications and electronics systems (e.g. TACOM Digitalization Rack for the FMTV, part number 12422685) located in a place that is accessible but does not interfere with visibility, ingress, or egress from the vehicle for following equipment:

Communication device, amperage draw (24 v)

- a. SINCGARS, 20 amp
- b. FBCB2 / BFT / DAGR, 10 amp
- c. CREWII (ECM) or DUKE, 50 amp
- d. VIC-03, 1 amp

All racks should be grounded IAW MIL HDBK 419A Grounding, Bonding Shielding for Military Equipments and Facilities. The alternator and/or auxiliary power output shall be sufficient to simultaneously power all the communications equipment as well as all the vehicle's automotive power needs (interior and exterior lighting, windshield wipers, etc.). A disconnect switch shall be provided on the digitalization rack or Power Distribution Module to shut off all of the equipment. Provisions shall also be made for external mounting of each required antenna and the routing of wiring to the communications mounting location. The Government will loan a communications set to the contractor, to devise and prove his configuration. The crew compartment location for the communications equipment shall provide space for a fold-down (or permanently affixed) keyboard.

3.12.11.1 Government Furnished Equipment Storage and Assembly. The Contractor shall be equipped to handle, receive, and install in the vehicle the "A-Kits" for the following equipment:

- a. SINCGARS, 20 amp
- b. FBCB2 / BFT / DAGR, 10 amp
- c. CREWII (ECM) or DUKE, 50 amp (when required)
- d. VIC-03, 1 amp

The required brackets to mount and accept the equipment (i.e., antenna, wires, intercom, etc.) shall be included as part of the vehicle. The Government will assist in the proper installation of these systems.

3.12.12 Video Displays/Cameras. The vehicle shall have following video displays/cameras that are linked together to view on any screen.

3.12.12.1 Exterior Cameras. The vehicle shall be equipped with three cameras (one front of vehicle, one rear of vehicle, one articulating arm) built into the vehicle hull to provide viewing capability to the cab main video displays and articulating arm display. An additional infrared camera capability is desired for the front and articulating arm camera. The front and rear cameras shall be hard-mounted as close to vehicle centerline as possible to aid the driver with immediate threats that can not be seen over the hood or in the blind spot in the rear. The camera shall have the capability to look out at a minimum of

45 feet. All cameras shall have a quick disconnect feature. It is desired that all cables used to attach the camera to the displays have cannon plugs attached at the end of the cables.

3.12.12.2 Main Video Display. The vehicle shall have two drop-down video display (10" screen minimum measured diagonally) that is linked to the front, rear, and articulating arm cameras in the vehicle. The first display needs to be located to be easily seen by the driver and co-driver. The second display (10" screen minimum measured diagonally, same capabilities as first display) needs to be located to be easily seen by the Soldiers sitting in the 2nd row of seats.

Switches will be provided with each display to toggle between cameras. The switches shall be independent for each display. The display shall have the capability to be stowed when not in use so that it does not hinder visibility. The displays need to be hard mounted to the vehicle.

3.12.12.3 Articulating Arm Display. The vehicle shall have a video display (5.5" screen minimum measured diagonally) on the passenger side of the vehicle that is linked to the articulating arm on the camera. The display will be used by the passenger to control the interrogation articulating arm. The display shall have the capability to be linked to the main video display. The display shall have the capability to be stowed when not in use so that it does not hinder visibility. It is desired to have a larger screen for the articulating arm display.

3.12.13 Rifle mounting provisions. The MPCV shall be equipped with rifle-mounting brackets capable of securing M16A1, M16A2, or M4 carbines, within reach of the occupants. The bracket design documented on drawing number 13229E8014 or 13229E8016 may be used as reference. Whether this or an original design is used, its placement (with rifles in place) shall not interfere with any occupants' movements or operation of the vehicle. Stowage shall be provided for the rifle ammunition as specified in the classified addenda to this purchase description.

3.12.14 Reserved.

3.12.15 Ancillaries. The vehicle shall provide the following items on all production vehicles:

- a. Tire pressure gauge, suitable for checking tire pressure on the vehicle.
- b. Hand tools; all required to perform operator/crew level maintenance procedures and attachment/removal of height reducible components.
- c. Basic Issue Items as listed in Attachment 1.

3.13 Articulating Arm. The vehicle shall be equipped with a hydraulic articulating arm with a digging attachment, camera (with tilt, pan, zoom capability; minimum tilt angle range of 240°, minimum pan angle range of 440°, minimum zoom capability of 25x.), and light that allows the operator to confirm, deny, or classify an explosive hazard threat from inside the blast protected MPCV. The hydraulic articulating arm must extend out up to 31 feet and allow the Soldier to interrogate a one square meter area within three minutes in sand up to 12 inches in depth. The controls for the articulating arm shall be located in the passenger side cab of the vehicle. The articulating arm shall have incremental measuring labels that are clearly visible from the window or the articulating arm camera view. Enhanced interrogation capabilities to the articulating arm are desired (air spade, I/R camera). It shall be operated by no more than one (1) Soldier. The articulating arm needs to be capable of moving explosive hazards to the side of a route. Digging attachment needs to be capable to hold up to 250 lbs (when fully extended). It is desired that the articulating arm have an automatic stow feature to stow the arm when interrogation is complete. It is desired to provide additional protection to the hydraulic lines.

3.13.1 Articulating Arm Interrogation: The Soldier must be capable of interrogating a suspected anti-tank mine from inside the vehicle. The interrogation arm must allow the Soldier to interrogate a one

square meter area within 3 minutes in sand (other soil surfaces / Objective) up to 12 inches (18 inches / Objective) in depth with an articulating arm (i.e., pick up and remove debris, and visually see the item for operator classification), and set it to the side of the route. The MPCV shall be equipped with an external white spotlight capable of illuminating (minimum 121 C.P.) suspected explosive hazards during the hours of darkness. It is desired that the spotlight be a one-piece design.

3.14 Vehicle performance characteristics. The vehicle shall be capable of meeting the performance criteria specified in the subordinate paragraphs, at a minimum. All performance requirements shall be met using JP-8 fuel. The vehicle shall operate on standard military fuels and lubricants with no adverse effect on vehicle components or serviceability. Scheduled maintenance intervals shall be as specified in the classified addenda to this purchase description. Performance requirements shall be met with front wheel drive disengaged, except that vehicles equipped with inter-axle compensating devices shall meet performance requirements with front wheel drive engaged. Requirements apply after exposure to and under any environmental conditions specified herein (see 3.17).

3.14.1 Operability. The vehicle shall be able to operate under all conditions specified herein, to within 10 percent of its fuel reserve.

3.14.2 Mobility. The vehicle, with full payload, shall be capable of paved road deployment (45%), secondary (39%) and cross country (trails) (16%).

3.14.2.1 Payload: The payload (as defined in 6.7.2) shall be as specified in the classified addenda to this purchase description.

3.14.2.2 Range: Refer to 3.4.4.

3.14.2.3 Speed: Capable of top speed and sustaining convoy speeds as specified in the classified addenda to this purchase description.

3.14.2.4 Reserved

3.14.2.5 Gradeability: The MPCV shall be capable of ascending and descending longitudinal slopes of not less than 20% (threshold) and traversing side slopes of not less than 44% (25 degrees) (threshold) (30% longitudinal; 61% (35 degrees) side, objective). A visual inclinometer needs to be provided to notify Soldiers when the limit is reached. The MPCV shall be capable of traversing an 18-inch (T) vertical-wall, 24 inch (O).

3.14.2.6 Fording: The MPCV shall be capable of fording salt or fresh water to a depth of 36 inches (threshold) without kit or preparation. (40 inches, objective)

3.14.2.7 Braking: The MPCV shall meet the performance requirements of FMVSS 121. The service brakes shall also stop and hold the vehicle on a 60 percent grade of dry concrete, traveling either uphill or down. In the event of a power assist failure, the brakes shall be operable with a force not to exceed 70 pounds with the vehicle on a level surface.

3.14.2.8 Overall Width: The MPCV shall have an overall width (excluding rearview mirrors and bar armor) of not more than 101.5 inches bumper to bumper (threshold). (86.0 inches objective). Width taken before bar armor is included (if included).

3.14.2.9 Turning diameter: The MPCV shall be capable of a wall-to-wall turning diameter of not more than 130 feet (threshold). (110 feet objective).

3.14.2.10 Towing: The MPCV shall be capable of towing a vehicle of the same type.

3.14.2.11 Approach and Departure Angles: The angle of approach shall not be less than 40 degrees and the angle of departure not less than 45 degree. Angles shall be defined in accordance with SAE J1100

3.15 Interface requirements

3.15.1 Dimensions. The vehicle, minus air intake and weapons ring, shall not be greater than 151.0 inches high. Height reduction shall be capable of being accomplished utilizing only onboard tools (see 3.12.15) in a timely fashion (i.e. quick disconnect capability for articulating arm camera). When configured for transport, the overall width shall not be greater than 101.5 inches (excluding bar armor). The vehicle shall have a minimum ground clearance of 18 inches. Additionally, the vehicle shall not exceed Gabarit International de Chargement (GIC) clearance dimensions (see 3.15.3) when loaded on a 50 inch high deck rail car.

3.15.2 Transportability. The vehicle shall be fit for self-deployment on highways worldwide and by M916 LET and M870 trailer; and capable of being transported by rail, marine, and air modes in C-5 and C-17 aircraft in accordance with MIL-STD-1366 as described in MIL-HDBK-1791. The vehicle shall conform to Gabarit International de Chargement clearance dimensions, shown on Figure 1, for rail transport, and transportability criteria as set forth in MIL-STD-1366. The vehicle design shall enable preparation for fixed wing air transport, and re-assembly after, to be accomplished in not more than 60 minutes (threshold) with no more than two Soldiers using only onboard tools. Slings and tiedown provisions shall counteract detrimental vibration and impact forces encountered in handling and transportation, without malfunction, damage, or permanent deformation. Lift and tiedown provisions shall be labeled as applicable in 1-inch high black letters.

3.15.2.1 Slings provisions. The vehicle shall be provided with slinging provisions conforming to MIL-STD-209. The provisions shall enable the vehicle to be lifted in its normal operating orientation.

3.15.2.2 Tiedown provisions. The vehicle shall be provided with integral provisions to permit tiedown to the floor or deck of the transport vehicle or airdrop platform. The tiedown provisions shall conform to MIL-STD-209.

3.15.2.3 Rail Transportability. The vehicle shall be rail transportable in CONUS and NATO countries without restrictions. The vehicle shall be capable of withstanding shock loads resulting from rail impact test without degradation or damage. When loaded on a 50-inch high rail car, the vehicle shall meet the dimensional requirements of the Association of American Railroads (AAR) Outline Diagram for Single Loads, Without End Overhang, on Open-Top Cars and the Gabarit International de Chargement (GIC) equipment gauge diagram which apply to Standard gauge rail lines in the Continental United States (CONUS) and European countries.

3.15.2.4 Marine Transportability. The vehicle shall be transportable on breakbulk (general cargo), roll-on/roll-off (RO-RO) ships, and barge carrying (LASH and SEABEE) ships without disassembly. The vehicle shall also be transportable on the LARC-LX and larger tactical lighterage.

3.16 Government-loaned property. Unless otherwise specified (see 6.2), the following property, in the quantities indicated in the contract or order, will be loaned by the Government (see 6.6):

<u>Description</u>	<u>Identification</u>
Nuclear, Biological, and Chemical protective ensemble (MOPP IV)	
SINCGARS Radio Set, AN/VRC-88A (w/RT1523 C/U) w/Antenna Vehicular AS-3684/VRC	5820-01-267-9481 w/ 5985-01-189-7925
FBCB2 with BFT	
CREW2 / ECM / DUKE	
VIC-03	
Current Army TMDE (SPORT or MSD)	N/A
Soldier Environmental Gear and Fighting Load	

Other vehicles listed in 3.15.2 are available for inspection at various government installations, and interface drawings are available for loan. Arrangements for access to them shall be scheduled through the contracting officer.

3.17 Environmental parameters.

3.17.1 Operating temperatures. The vehicle shall perform as specified herein, continuously for 14.5 hours, in any ambient temperature from -25°F to 135°F, without performance degradation, or mechanical or electrical failure.

3.17.2 Storage temperatures. The vehicle shall withstand storage in hot, basic and cold environments IAW AR 70-38.

3.17.3 Rain. The vehicle, in its operational configuration, shall be capable of withstanding rain at a rate not less than 4 in/hr with a wind velocity not less than 40 mph with no water intrusion into the crew compartment.

3.17.4 Fungus. Components and materials used in the construction of the vehicle shall be fungus-inert (see 6.7.7). Parts not constructed of fungus-inert materials shall be treated with moisture and fungus proof varnish or other commercially available preparation. This requirement need not apply to components within hermetically sealed enclosures.

3.17.5 Sand/Dust. The crew compartment shall be protected and sealed from blowing dust, and sand intrusion. All ingress/egress points shall prevent dust from entering the interior during transport and while in use.

3.17.6 Electromagnetic Environmental Effects (E3). The MPCV shall be electromagnetically compatible among all subsystems and equipment within the system and with E3 external to the system. To meet this requirement compliance to MIL-STD 464 to the extent delineated in the following paragraphs shall be achieved.

3.17.6.1 Intra-system Electromagnetic Compatibility (EMC). The system shall be electromagnetically compatible within itself such that the system operational performance requirements are met. Individual subsystems and equipment shall meet interference control requirements (such as conducted emissions, radiated emissions, conducted susceptibility and radiated susceptibility requirements of MIL-STD 461) such that the overall system complies with MIL-STD 464.

3.17.6.2 Inter-system EMC. The system shall be electromagnetically compatible with its defined Electromagnetic Environment (EME) such that its operational performance requirements are met. The applicable external EME for ground systems is described in MIL-STD-464 Table 1C. Inter-system EMC covers compatibility with, but is not limited to like platforms (such as other MPCVs), friendly emitters, and hostile emitters.

3.17.6.3 Reserved

3.18 Sustainment parameters.

3.18.1 Maintainability. Provisions shall be made for inspection, adjustment, servicing, and replacement of components. Contractor Logistics Support, if required, shall not be lower than Field Level Maintenance (IAW 2 Level Maintenance System) as defined in AR 750-1, para 3-9. Items requiring preventive maintenance (before, during, after) shall be accessible without requiring removal of other components. When openings are necessary for access to components, they shall conform to the requirements of 3.21.4 and be provided with a removable or hinged cover when in an exterior wall or bulkhead. It is desired that quick disconnects are provided on all cables and hoses that pass thru the vehicle hull.

3.18.2 Compatibility. The MPCV shall be compatible with the Standard Army Logistics System for existing equipment and be consistent with commercial industry's maintenance support concepts. No more than 5% of the tools and equipment (threshold) shall be from outside the standard Army inventory for battle damage repairs and regular maintenance. (100% of tools and equipment from within the standard Army inventory, objective)

3.18.3 Ease of maintenance. The time required to accomplish operator's preventive maintenance checks and service (PMCS), Before/During/After on the vehicle shall be not more than 65 minutes and shall require no more than the operator plus one (1) crew member. Provisions for drainage of liquids from components shall not permit drainage onto other components; but directly, or routed, into a suitable container. Drain plugs installed in engine, transmission, transfer case, and axles shall be at the lowest point and feature permanent magnet assembly or an equivalent ease-of-maintenance aid(s). The same or similar ease-of-maintenance aids shall be incorporated into other components requiring disengagement or disassembly, like the transmission oil pan, filter housings, etc. Labor saving components/equipment (such as engine oil bypass filtration) provided with the vehicle is desired. All services shall take no more than 12 man-hours. Scheduled maintenance intervals shall not be less than 9,000 miles/3,000 hrs/or annually, whichever comes first. Operator's and Maintenance manuals shall be electronic technical manual. It is desired that all drain lines are easily able to be removed so that the fluid is not drained to the bottom of the hull.

3.18.4 Basic Issue Item Box. The vehicle shall be equipped with a Basic Issue Item (BII) Box that can be stored on board of the vehicle. The BII shall contain the necessary equipment to perform daily checks and maintenance on the vehicle.

3.18.5 Reliability. The Mean Miles Between System Abort - Mobility for the MPCV shall be at least 1500 miles demonstrated or assessed at high confidence. The Maintenance Ratio will be no greater than 0.23 maintenance hours per operating hour. For purposes of evaluating the MR, an operating hour is considered to be equivalent to an engine operating hour. The reliability of the interrogation subsystem shall be at least 100 hours Mean Time Between System Abort (MTBSA). For the interrogation subsystem, the operating hours are defined as route clearance operating hours, during which the MPCV is actively performing route clearance operations (i.e. moving or interrogating). The MTBSA, MMBSA-M and MR include all system aborts and associated maintenance which occur during government testing,

regardless of the cause (i.e. includes system aborts attributed to hardware as well as accident, crew/operator, maintenance personnel, technical documentation, and training).

3.18.6 Vehicle durability. During normal use, in any of the environments specified, components, to include seals, welds, etc., shall not sustain damage that impairs structural integrity, develops malfunctioning systems, or changes the operating characteristics of the vehicle.

3.18.7 Repairability. Battle Damage Assessment and Repair (BDAR) capabilities will emphasize rapid battle damage assessment and field repairs to the platform and interrogation capability. Must be rapidly repairable after an inadvertent anti-tank mine or improvised explosive device blast.

3.19 Force Protection. Force protection is defined as “Protection of personnel (Soldiers) inside the vehicle against the identified threats.” The MPCV shall be armored in order to prevent crew compartment penetration from a variety of threats. Sufficient armor shall also include the use of transparent armor. These aggregate added armors shall provide crew protection against all of the following threat classes:

- a. Mine blast. Protection from mine blasts shall be provided in accordance with the classified addenda to this purchase description.
- b. Ballistic protection. Ballistic protection shall be provided in accordance with the classified addenda to this purchase description.
- c. Fragmentation. Fragment protection shall be provided in accordance with the classified addenda to this purchase description.
- d. Overhead airburst. Protection from overhead airburst shall be provided in accordance with the classified addenda to this purchase description.
- e. RPG. RPG protection shall be provided in accordance with the classified addenda to this purchase description. Protection shall result in minimal or no primary or secondary spall fragmentation from an RPG attack.

3.19.1 Electromagnetic Radiation Hazards (EMRADHAZ). The vehicle shall protect personnel, fuels and ordnance from hazardous effects of electromagnetic radiation.

3.19.1.1 Hazards of Electromagnetic Radiation to Personnel (HERP). The system shall comply with current national criteria for the protection of personnel against the effect of electromagnetic radiation. DoD policy is currently found in DoDI 6055.11.

3.19.2 Hazards of Electromagnetic Radiation to Fuel (HERF). Radiated EMEs shall not inadvertently ignite fuels. The EME includes onboard emitters and the external EME (see 3.17.6).

3.19.3 Nuclear, biological, and chemical (NBC) contamination. Vehicle exterior components, to include any hydraulic hoses, shall be able to operate in an NBC environment and survive decontamination. Materials, particularly those used externally, shall be resistant to chemical and biological agents and to the decontaminators used to neutralize these agents. An NBC Overpressure System is desired.

3.19.3.1 Mounting Bracket, M100 Sorbent Decontamination System (SDS). This mounting bracket, NSN: 5340-01-466-5928, will provide the necessary hardware for mounting one decontamination apparatus on the vehicle (away from heat sources) and in an accessible location. Holes shall be predrilled for attachment of the government furnished bracket assembly. Holes shall be sealed with plugs or fasteners. (Note: The M100 mounting bracket has the same hole configuration as the bracket for the M11 Decontamination Apparatus.)

3.20 System survivability. System survivability is defined as, “The system’s ability to survive against the identified threats and be repairable.” Some blasts are designed to blow parts and be repaired with BDAR kits resulting in a temporary delay.

3.20.1 Threats. Equivalent to those listed above for Force Protection (see 3.19).

3.20.2 Reserved.

3.20.3 Reserved.

3.20.4 Welding. All ferrous armor and structural steel with a yield strength greater than 80 KSI shall be welded IAW the provisions contained in AWS D1.1. All weld procedures shall be qualified to the provisions contained in AWS D1.1 and documented in the procedure qualification record (PQR) format. As the filler metal will typically not meet base material properties, the acceptance criteria for tensile testing of the qualification weldments shall be coordinated with the designated government representative. The welding of other materials and steel less than 80 KSI yield strength shall be done to any AWS welding standard appropriate for the material, thickness and welding process selected. Documented welding procedures shall be available and qualified to the AWS standard selected for use. All welders shall be qualified to the appropriate welding standard prior to production welding.

3.20.4.1 Weld joint design. The preferred weld joint design is a lap joint for maximum structural integrity and survivability. All weld seams (groove welds) associated with the crew compartment that are not at the edges of the vehicle shall be reinforced to assure that the weld area meets the protection level of that surface.

3.21 Human engineering. Human engineering criteria principles and practices shall be considered as part of the vehicle construction. The vehicle shall be capable of being deployed and operated by 5th through 95th percentile male military personnel in mission oriented protective posture (MOPP) IV gear (see 3.21.1). The vehicle shall be capable of being maintained by the 5th percentile female through 95th percentile male military personnel in mission oriented protective posture (MOPP) IV gear. The use of night-vision goggles by the operator shall be considered in the layout and light intensities of displays. Special emphasis shall be given, but not limited to, visual displays, control/display integration, controls, labeling, anthropometry, design for maintainability, and hazard and safety criteria, as applicable. MIL-HDBK-759 may be used for information and guidance on human factors engineering for Army materiel, and MIL-STD-1472 may be used as a source for anthropomorphic data.

3.21.1 Personnel gear. The vehicle and all its controls and systems shall be operable by personnel wearing the following protective clothing. Unless otherwise specified (see 6.2), the following property, in the quantities indicated in the contract or order, will be loaned by the Government (see 6.6):

MOPP IV:

a.	Chemical-biological mask	MIL-M-51282	(NSN 4240-00-926-4200)
b.	Chemical-biological hood	MIL-H-51291	(NSN 4240-00-999-0420)
c.	Chemical protective suit	MIL-S-43926	(NSN 8415-00-407-1062)
d.	Chemical protective glove set	MIL-G-43976	(NSN 8415-00-033-3519)
e.	Chemical protective footwear	MIL-F-43987	(NSN 8430-01-021-5978)
f.	Environmental protective gear		

3.21.1.1 Night Vision Goggles. The use of night-vision goggles by the operator shall be considered in the layout and light intensities of displays. Special emphasis shall be given, but not limited to, visual displays, control/display integration, controls, labeling, anthropometry, and design for maintainability, and hazard and safety criteria, as applicable.

3.21.2 Human factors. The design shall foster effective performance of operating procedures, an effective personnel safety and health environment, and minimize factors that contribute to increased operator error. The design shall incorporate protection from toxic, electrical, thermal, mechanical, and other potential hazards. The design shall also reflect efficient arrangement of equipment and components; and feature characteristics that ensure a rapidity, safety, ease, and economy of use. The equipment shall represent the simplest design consistent with functional requirements.

3.21.3 Noise limits. Steady state interior noise level at each crew compartment seating position shall not exceed 85dB when tested in accordance with 4.5.12.1. If the steady state noise level is above 85dB, and remedial procedures for noise suppression have been pursued to the satisfaction of the procuring activity, and permission to exceed the limit(s) is obtained, then hazard sign(s) shall be provided (see 3.18.4.1). At a minimum, each sign shall state "CAUTION High Intensity Noise Hearing Protection Required" and shall be legible from the distance indicated on the sign per MIL-STD-1474. If signs are on the outside of the vehicle they will need to specify a distance (i.e. "within 20 feet").

3.21.4 Accessibility. Compartment access and handles shall reflect compatibility with the Clothing and Personal Equipment (C/PE) of personnel using and maintaining equipment, under the environmental conditions specified herein, having space allocations commensurate with the restrictions imposed on performance by C/PE. The handles or grasp areas shall also be located to provide clearance from obstructions, and shall not interfere with operation or maintenance of the vehicle or individual component installation and removal. Proper orientation of ancillary items and components for stowage on the unit shall be made obvious, either through compartment or fixture design or by means of appropriate labels.

3.22 Safety. The vehicle shall comply with applicable OSHA 29 CFR 1910 and 1926 Regulations. Asbestos, cadmium, radioactive material, and ozone depleting chemicals shall not be used in or on the vehicle. Safety signs in accordance with SAE J115 shall be used where necessary. The engine hood(s) shall be of double latch construction meeting requirement 113.1 of MIL-STD-1180. Construction shall incorporate methods to protect personnel from shock hazards, to include consideration of ground currents and voltage limits (possible arcing). Adequate safeguards shall be incorporated into the design of the vehicle and its components so that personnel shall not be exposed to concentrations of toxic or corrosive substances. Equipment that, in normal operation, exposes personnel to surface temperatures greater than 120 °F for prolonged contact or handling, or 140 °F for momentary contact, shall be appropriately guarded. Except where functionally required, exposed surfaces shall be free from burrs, sharp edges and corners, or other features that present a personnel safety hazard; or shall be shielded against contact. Danger or caution signs, labels, and markings shall be used to warn of potential or specific hazards. The sign(s) shall conform to NEMA Z 535.2, be prominently displayed on the unit, and visible from any angle of approach. The accelerator control system for the vehicle shall meet the requirement 124.1 of MIL-STD-1180.

3.22.1 Fire Safety. The contractor shall provide fire detection and extinguishing systems, including all necessary fire sensors, extinguishers, electronic controls, displays, harnesses, mounting brackets, and fasteners to protect engine and the vehicle from these fires. The space claim and weight impact on the MPCV shall be minimized to the maximum extent practicable.

3.22.2 Engine Compartment Fire Suppression. At minimum a manual fire extinguishing system shall be provided that protects the engine compartment and transmission of the MPCV from intentionally caused and rapidly-developing fires generated by flame-enhanced improvised explosive devices (IED) and other peacetime or combat threats. This system should be common to other Army systems that are used.

- a. Shall be capable of at minimum manual activation
- b. Shall be compatible with the vehicle electrical system.
- c. Fires shall be extinguished within 10 seconds of ignition.
- d. Shall not contain Class I or Class II ozone depleting chemicals as specified in the Clean Air Act of 1990.
- e. Shall be capable of both automatic sensing and extinguishing and manual activation.
- f. Refill capabilities and procedures shall be compatible with existing army recharge equipment (NSN 4210-01-474-6206, TB 9-4210-245-50). Any unique tools, fittings, or equipment shall be identified and available for Army provisioning. Any replacement/rebuild parts required to service the AFES shall be available in individual kit form.

3.22.3 Crew Compartment Fire Suppression. An automatic fire extinguishing system (AFES) shall be provided that protects the crew compartment of the MPCV from intentionally caused and rapidly-developing fires generated by flame-enhanced improvised explosive devices (IED) and other peacetime or combat threats. This system should be common to other Army systems that are used. In addition to the requirements for the Engine AFES listed above (3.22.2), the Crew compartment AFES shall meet the following requirements:

- a. The system shall be integrated so that it does not interfere with normal or emergency ingress, egress, or operation of the vehicle with its full crew.
- b. The AFES shall not discharge directly at any normal crew position. The discharge force shall not exceed 20 PSI at 5 inches from any extinguisher outlet or nozzle.
- c. Compartment overpressures, agent concentrations, by-products, and oxygen levels shall be acceptable to U.S. Army Surgeon General (ref: Medical Evaluation of Non-Fragment Injury Criteria, dated September 1989).
- d. Impulse noise levels during extinguisher discharge shall not exceed 140 dB at all normal positions.
- e. Shall be capable of both automatic sensing and extinguishing and manual activation.
- f. Shall be active and operable when the vehicle is running and for a minimum of 1 hour after the vehicle electrical power has been turned off.

3.22.4 Fire extinguisher. Each vehicle shall be provided with two fire extinguishers in accordance with A-A-393, and shall be securely installed inside the cab in a location readily accessible to the operator(s). The extinguisher should be common to other Army systems that are used.

3.22.5 Exterior Fire Suppression. Desired that the vehicle have an AFES that protects the vehicle from external intentionally caused and rapidly-developing fires generated by flame enhanced IED and other peacetime or combat threat.

3.22.6 Backup alarm. A backup alarm conforming to SAE J994, type C shall be provided. The alarm shall be capable of being manually switched off and shall be automatically disabled when operating

in the blackout mode (see 3.6.2). The backup alarm signal shall be not less than 10 dB above ambient noise levels and distinguishable from other onboard alarms.

3.22.7 Horn. An operator-controlled horn shall be furnished. The horn shall be 20 dB(A) above the vehicle operating sound level at a distance of 50 feet in front of and behind vehicle. The horn shall be inoperable under blackout conditions (see 3.6.2).

3.22.8 Whole Body Vibration. Vehicle shall not create vibrations that are harmful to the operator and crew during operation. Induced vibrations to the operator under all operating conditions shall be measured in accordance with SAE J1013.

3.23 Reserved.

3.24 Marking. The MPCV shall have marking or permanently attached data plates in accordance with MIL-STD-130. Safety and instructional markings shall not be obscured by components, from the operator's position, to include occasionally positioned levers, etc. Spillage or seepage of fluids, gaseous emissions, accumulations of grime, and areas subject to wear shall also be avoided in placement.

3.24.1 Identification. An identification plate in accordance with A-A-50271 shall be provided in a prominent location at the front of the vehicle. At a minimum, the unit shall be marked with:

- Manufacturer's identification
- Manufacturer's part number
- Date of manufacture
- Serial number
- Contract number
- Item nomenclature
- Type of unit
- National stock number
- Item Unique Identification (IUID) – information available: www.iuidtoolkit.com
- Military load classification
- CARC/Month/Year

All components removed or disassembled for shipment shall be individually identified, with match marking as required for ease of replacement and proper re-assembly.

3.24.2 Safety, instructional, and component identification. Informational marking and lettering shall be flat black, centered and sized proportionate to the surface on which it is inscribed, and legible from the distance from which it is intended to be read. Plates in accordance with ANSI Z535.1 and Z535.3 may be used in lieu of, or in conjunction with, lettering. On vehicles with a camouflage pattern, markings shall be in accordance with requirements for camouflage. Weight, centers of gravity, dimensional information, lift, tiedown, and slinging provisions shall be identified, and the required tire pressure shall be inscribed above each tire as "TP (specify) LBS" in one inch black letters. Caution markings shall be in accordance with NEMA Z535.2.

3.24.3 Military load classification identification. The classification number shall be computed in accordance with STANAG 2021 and the sign shall be in accordance with STANAG 2010 for front signs.

4.0 VERIFICATION

4.1 Classifications of inspections. The inspection requirements specified herein are classified as follows:

- a. First Article Test (see 4.2)

b. Conformance inspection (see 4.3)

4.2 First article inspection. First article inspection shall be performed on one or more complete Buffalo Mine Protected Clearance Vehicle(s) (MPCVs), as specified in the contract (see 3.1). The inspection shall include the examination of 4.4 and the tests of 4.6.1 through 4.11.

4.3 Conformance inspection. Quality conformance inspection shall include the examination of 4.4 and the tests 4.5.1 and 4.5.4

4.4 Examination. Each Buffalo MPCV shall be physically examined for compliance with the requirements specified in Table I, to include performance, safety, human engineering, and dimensional requirements. The contractor shall demonstrate, or provide evidence, of compliance of items to the requirements where it is not readily discernible or identifiable (e.g., BITE). Noncompliance with any requirement or the presence of one or more defects that lessens the required efficiency shall constitute cause for rejection. Each unit shall be examined for the defects specified in Table 1. The government reserves the right to perform any amount (or additional) of inspection and testing that is necessary to verify the conformance to all requirements in Section 3. Unless otherwise specified, all inspections and tests shall be performed at the vehicle's or vehicles' maximum gross vehicle weight (GVW).

4.5 Methods of inspection.

4.5.1 Test. Verification shall be accomplished through systematic operation of the end item under appropriate conditions, with or without instrumentation, and the collection, analysis, and evaluation of quantitative data.

4.5.2 Analysis. Verification shall be accomplished by technical or mathematical evaluation, mathematical/computational modeling and/or simulations, algorithms, charts, or diagrams, and representative data.

4.5.3 Examination. Verification shall be accomplished by visual examination of the end item or its components, reviewing descriptive documentation, certifications, and comparing characteristics to established criteria.

4.5.4 Demonstration. Verification shall be accomplished by appropriate functional checks and/or operation of the end item or its components.

4.5.5 Certification. Conformance to a specific requirement or standard shall be demonstrated by a document signed by the certifying official or responsible party. When required by contract or this specification, Certifications may be used in lieu of additional verification methods and shall include supporting documentation (test data, materiel analysis, etc.).

The following table (Table 1) displays the verification method and event for each applicable Section 3 requirement. All verifications referenced in this table may be modified at the discretion of the government by deletion or addition of items listed to assure conformance to specification and/or contractual requirements.

TABLE I – Verification Matrix

Req. Ref	Paragraph Title	Ver. Ref.	Verification Method					Verification Event				
			Cert	Anls	Demo	Exam	Test	FPVI	PVT	QCI	CT	FPT
3.1	First Article	4.6-4.6.2	X	X	X	X	X	X	X	X		
	First Production Vehicle Inspection	4.6.3						X		X		
	Production Verification Test	4.6.4							X	X		
	Quality Conformance Test	4.6.5								X	X	
	Control Test	4.6.6									X	X
	Follow-on Production Test	4.6.7										X
3.2.1, 3.2.2-4	Materials, Rubber materials, and Recycled, recovered, or environmentally preferable materials	4.7	X					X				
3.2.5	Corrosion prevention and control	4.7.1	X			X		X		X	X	
3.2.1.1	Hazardous Materials	4.7.2	X			X		X				
3.2.6	Finish	4.7.3				X	X	X		X		
3.2.7	Camouflage	4.7.4	X			X		X		X		
3.3	Configuration	4.8				X		X		X		
3.4	Components and Ratings	4.9	X	X		X		X		X		
3.4.1	Engine	4.9.1	X	X		X	X		X			X
3.4.1.1	Engine air intake	4.9.2			X			X	X	X		X
3.4.1.2	Dusty Conditions	4.9.3			X			X	X			X
3.4.2	Cooling system	4.9.4			X			X	X			X
3.4.3	Lubricating Oil(s)	4.9.5	X					X		X		
3.4.3.1	Hydraulic Fluid(s)	4.9.6	X					X		X		
3.4.4	Fuel tanks	4.9.7	X			X		X	X	X		X
3.4.5	Exhaust system	4.9.9				X		X		X		
3.4.6	Transmission	4.9.10	X	X		X	X	X	X	X		X
3.4.7	Electrical system	4.9.11	X		X	X		X	X	X		X
3.4.7.1	Alternator/Regulator	4.9.12	X			X		X	X	X		X
3.4.7.2	Starter	4.9.13				X		X	X	X		X
3.5	Slaving components	4.9.19				X		X	X	X		
3.6	Lighting	4.9.23			X			X	X	X		
3.6.1	Headlights	4.9.24			X			X	X	X		
3.6.2-4	Blackout lights and Crew lighting	4.9.25			X			X	X	X		X
3.6.2.5, 3.6.2.5.1	Spotlight and Area lighting	4.9.26			X			X	X	X		X
3.7, 3.7.1	Wiring	4.9.28	X			X		X		X		
3.8 & .1	Battery and Battery mounting	4.9.29				X		X		X		

TABLE I – Verification Matrix (cont'd)

Req. Ref	Paragraph Title	Ver. Ref.	Verification Method					Verification Event				
			Cert	Anls	Demo	Exam	Test	FPVI	PVT	QCI	CT	FPT
3.9 -3.9.2	Test Equipment	4.9.30	X		X				X			X
3.10	Reserved	4.9.31										
3.11	Vehicle hull or Chassis	4.9.32				X	X	X	X	X		X
3.11.1 & .3	Axles and Suspension	4.9.33	X			X		X	X	X		X
3.11.2	Torque limiting differentials	4.9.34			X	X		X	X	X		X
3.11.4	Tires and Wheels	4.9.35	X			X		X	X	X		X
3.11.4.1	Wheel Splash and Stone Throw Protection	4.9.36				X		X		X		
3.11.5	Service brakes	4.9.37					X	X	X	X		X
3.11.5.1	Air system	4.9.38				X		X	X	X		
3.11.5.2	Trailer brakes (Desired)	4.9.39			X	X		X	X	X		X
3.11.5.3	Increased braking ability (Desired)	4.9.40				X	X	X	X	X		X
3.11.5.4	Parking brake	4.9.41					X	X	X	X		X
3.12	Crew compartment	4.9.42					X	X		X		
3.12.1-3.12.2.2	Seating	4.9.43	X		X	X		X	X	X		X
3.12.3	Glass	4.9.44	X				X	X	X	X		X
3.12.4	Ventilation System	4.9.45			X			X	X			X
3.12.5	Ingress/Egress Points	4.9.46			X	X		X	X	X		
3.12.5.1	Emergency Ingress/Egress	4.9.47			X	X		X	X	X		
3.12.6 - 3.12.6.2	Storage	4.9.48			X	X		X	X	X		
3.12.7	Towing Points	4.9.49				X	X	X	X	X		X
3.12.9	Gauges and instruments	4.9.50			X	X		X	X	X		
3.12.10	Cab accessories	4.9.51				X	X	X	X	X		
3.12.11-3.12.11.1	Communications and Electronic Countermeasures	4.9.52				X		X		X		
3.12.12-3.12.12.3	Video Displays & Cameras	4.9.53				X		X		X		
3.12.13	Rifle mounting provisions	4.9.54				X		X		X		
3.12.15	Ancillaries	4.9.56				X		X		X		
3.13-3.13.1	Articulating Arm and Interrogation	4.9.57					X	X	X	X		X
3.14	Vehicle performance characteristics	4.9.58	X				X	X	X	X		X
3.14.1	Operability	4.9.59					X	X	X	X		X
3.14.2	Mobility	4.9.60					X	X	X	X		X
3.14.2.1	Payload	4.9.61					X	X	X	X		X
3.14.2.2	Range	4.9.62					X	X	X	X		X
3.14.2.3	Speed	4.9.62					X	X	X	X		X
3.14.2.4	Reserved	4.9.63										
3.14.2.5	Gradeability and Stability	4.9.64					X	X	X	X	X	X
3.14.2.6	Fording	4.9.65					X	X	X	X	X	
3.14.2.7	Braking	4.9.66					X	X	X	X	X	X
3.14.2.8	Overall Width	4.9.67	X			X		X		X		
3.14.2.9	Turning Diameter	4.9.68					X	X	X	X	X	X

3.14.2.10	Towing					X	X	X	X			X
3.14.2.11	Approach and Departure Angle	4.9.69					X	X	X	X		X
3.15-3.15.1	Interface requirements & Dimensions	4.9.70				X		X		X		

TABLE I – Verification Matrix (cont'd)

Req. Ref	Paragraph Title	Ver. Ref.	Verification Method					Verification Event				
			Cert	Anls	Demo	Exam	Test	FPVI	PVT	QCI	CT	FPT
3.15.2	Transportability	4.9.71	X		X			X	X	X		X
3.15.2.1-3.15.2.2	Slings provisions and Tie-down Provisions	4.9.72	X		X	X		X	X	X		
3.15.2.3	Rail Transportability	4.9.73	X				X	X	X			
3.15.2.4	Marine Transportability	4.9.74	X				X	X	X			
3.16	Government Loaned Property					X		X	X	X		
3.17-3.17.2	Environmental parameters; Operating temperatures; Storage temperatures	4.9.75					X	X	X			X
3.17.3	Rain	4.9.76					X	X	X	X	X	X
3.17.4	Fungus	4.9.77	X				X	X	X	X		
3.17.5	Sand/Dust	4.9.78			X	X		X	X	X		X
3.17.6	Electromagnetic Environmental Effects (E3)	4.9.79	X	X			X	X	X	X		X
3.17.6.1-3.17.6.2	Intra-system Electromagnetic Compatibility (EMC)	4.9.80	X	X			X		X			X
3.17.6.3	Reserved	4.9.81										
3.18	Sustainment parameters	4.9.82				X		X		X		
3.18.1	Maintainability	4.9.83				X		X	X	X		X
3.18.2	Compatibility	4.9.84				X		X	X	X		X
3.18.3-3.18.4	Ease of maintenance and BII	4.9.85			X	X		X	X	X		X
3.18.5-3.18.6	Reliability, Availability, and Maintainability (RAM) and Durability	4.9.86					X	X	X	X		X
	Durability						X		X			X
3.18.9	Reparability	4.9.87				X			X			X
3.19 a-e	Force Protection (inclusive of sub-paragraphs)	4.9.88					X	X	X	X		X
3.19.1	Electromagnetic Radiation Hazards (EMRADHAZ)	4.9.89	X	X				X	X	X		X
3.19.1.1	Hazards of Electromagnetic Radiation to Personnel (HERP)	4.9.90	X	X				X	X	X		X
3.19.2	Hazards of Electromagnetic Radiation to Fuel (HERF)	4.9.91	X	X				X	X	X		X
3.19.3	NBC	4.9.93	X	X				X	X	X		X
3.19.3.1	Mounting Kit, M100 Decontamination System	4.9.94				X		X	X	X		X
3.20-3.20.1	System survivability	4.9.96				X	X	X	X	X		X
3.20.4	Welding	4.9.97	X			X	X	X		X		
3.20.4.1	Weld joint design	4.9.98				X	X	X		X		
3.21	Human engineering	4.9.99	X		X			X	X	X		X
3.21.1.1	Night Vision Goggles	4.9.100			X			X	X	X		X

3.21.2 - 3.21.3	Human Factors and Noise limits	4.9.101		X		X	X	X	X	X		X
3.21.4	Accessibility	4.9.102				X		X	X	X		X
3.22	Safety	4.9.103	X					X	X	X		X
3.22.1- 3.22.5	Fire Safety (inclusive of subparagraphs)	4.9.104	X			X	X	X	X	X		X

TABLE I – Verification Matrix (cont'd)

Req. Ref	Paragraph Title	Ver. Ref.	Verification Method					Verification Event				
			Cert	Anls	Demo	Exam	Test	FPVI	PVT	QCI	CT	FPT
3.22.6	Backup alarm	4.9.105	X			X	X	X	X	X		X
3.22.7	Horn	4.9.106			X			X	X	X		X
3.22.8	Whole Body Vibration	4.9.107			X				X			X
3.24- 3.24.1	Marking and Identification	4.9.108				X		X	X	X		X
3.24.2	Safety, instructional, and component identification	4.9.109				X		X	X	X		X
3.24.3	Military load classification identification	4.9.110				X		X	X			X
	Workmanship	4.9.111				X		X		X		
	Preparation for Delivery	4.9.112	X			X		X		X		

Verification Tests

First Production Vehicle Inspection (FPVI)
 Production Verification Test (PVT)
 Follow-on Production Test (FPT)
 Quality Conformance Inspection (QCI)
 Control Test (CNT)

Location

Manufacturer's Facility
 Government Test Site
 Government Test Site
 Manufacturer's Facility
 Manufacturer's Facility

4.6 Performance.

4.6.1 Test Conditions. Unless otherwise specified (see 6.2), all tests shall be performed without shelter at climatic conditions existing at the place of test. The Buffalo MPCV shall be operated as specified without maintenance, other than scheduled maintenance as established by the maintenance schedule prepared by the contractor prior to testing. Before testing, each Buffalo MPCV shall be subjected to a run-in test (a minimum of 15 miles on hard surface). All inspection equipment (meters, gauges, etc.) utilized for verification shall have been calibrated to a governing national standard, within the preceding six (6) months. The contractor shall ensure that the Buffalo MPCV completely satisfies the requirements of FMVSS 121 or FMCSR for the braking system, entirely, initially, as a First Article Test requirement. Braking tests conducted on the subsequent production vehicles shall equally apply.

4.6.2 First Article Test. When required by the contract, this test, at a minimum, shall consist of a First Production Vehicle Inspection (FPVI) and Production Verification Test (PVT).

4.6.3 First Production Vehicle Inspection (FPVI). The contractor shall conduct a complete inspection on the first production vehicle(s) produced (as specified in the contract). The FPVI shall take place at the contractor's facility or the place of manufacture of the Buffalo MPCVs and whose facilities will serve as the place of manufacture for the production contract quantities. Methods of verification as described in this purchase description shall be utilized for all inspections and tests (see Tables I and III) and paragraph 4.1. The FPVI shall start at during fabrication and continue until the completed Buffalo

MPCV quantity(ies) for First Article that are specified in the contract.. The government may witness or participate in all or any part of the FPVI.

4.6.3.1 In-Process Inspection. During fabrication of first production vehicle, in-process inspections shall be performed by the contractor and witnessed by government representatives, to evaluate conformance to the section 3 requirements referenced in Table I for those items and/or processes which can not be evaluated once the end item is in its final form. In addition, evaluation of process controls and workmanship shall be made at this time. During the inspection, the contractor shall have available for review and evaluation the following records: quality manual (or appropriate document) work instructions, process procedures, inspection records, and welder certifications. When directed by the government, these inspections shall be made prior to the application of primer and paint.

4.6.3.2 Contractor Inspection. The first production vehicle(S) shall be inspected by the contractor, as a minimum, to the requirements of Tables I and Table III. Upon completion of inspection, the contractor shall submit this vehicle, and all records associated with its inspection, to the designated government element for review and/or additional verification. The government reserves the right to witness and/or participate in this inspection. As part the contractor's first production vehicle inspection, the contractor shall perform a 500 mile road test on the first production vehicle(s), as described in the contract. The contractor shall also utilize the PCO approved FIR (Final Inspection Record) for the current production contract to conduct safety checks and inspections to assist in the FPVI.

4.6.3.3 First Production Vehicle Disposition. When required by contract, the vehicle, which was utilized for the First Production Vehicle Inspection (FPVI), shall remain at the manufacturer's facility, in order to serve as a manufacturing standard, unless otherwise directed by the PCO. The manufacturing standard shall be the last vehicle(s) delivered on the contract.

4.6.4 Production Verification Test (PVT). As part of the First Article Test (FAT), a PVT will be conducted by the Government, at a government test site to verify product conformance to the requirements described in the purchase description and to evaluate and assess production capability of the Buffalo MPCV.

4.6.5 Upon completion of First Production Vehicle Inspection, one or more production vehicles shall undergo production verification testing at a designated government approved test site to evaluate conformance to section 3 requirements as referenced in Table I. When required by contract, after completion of Production Verification Test, test vehicle(s) shall be updated to the approved final first article configuration. Unless otherwise stated in the contract, Production Verification Test, test vehicles will be operated in accordance with the test profile below, Table II:

TABLE II – 12,000 MILE DURABILITY TEST PROFILE

%	TERRAIN	MAX SAFE SPEED UP TO	TOTAL MILES	MILES (PER INTERVAL)
45	Primary Road	See PD addenda	5,400	(150)
39	Secondary Road	TBD (determined by operator)	4,680	(150)
8	Cross Country – Level	TBD (determined by operator)	960	(50)
8	Cross Country – Hilly	TBD (determined by operator)	960	(50)

Note: All test distances shall be conducted at full Buffalo MPCV system payload to its maximum required capacity of the towing vehicle payload, 50% of the time, ½ maximum required capacity 25% of the time, and no load 25% of the time.

4.6.6 Quality Conformance Inspection (QCI). Each vehicle produced shall undergo a complete final inspection by the contractor to the degree necessary to assure a defect free product. This inspection shall include those section 3 requirements as referenced in Table I. The QCI shall be conducted and documented using a contractor prepared and government approved FIR. A complete copy of the FIR shall be submitted to the Government with each vehicle offered for acceptance.

4.6.7 Track/Route (T/R) or Road Test. Transmission, engine oil, radiator fluid, power steering fluid, and hydraulic brake fluid levels shall be checked and adjusted if necessary before the test. Before, during and after the test, all vehicle-equipped gages and instrumentation shall be monitored for proper operations and readings. The vehicle shall be operated for a minimum of 50 miles, at the sustained top vehicle speed, on a relatively level, hard surfaced test T/R and shall complete the following series of tests:

- a. Start and stop the engine not less than five times.
- b. Make at least five abrupt stops, from a speed not less than 30 mph, using the service brakes.
- c. Maneuver at least two times through a figure-eight steering course, at maximum safe speed.
- d. Release and reapply the parking brake not less than five times.
- e. The vehicle shall be operated to verify that the transmission transfer case operates properly.
- f. The vehicle shall also be driven in reverse for a distance of not less than 50 feet.

4.6.7.1 The test T/R shall be capable of allowing the test vehicles to operate at a minimum of 40 mph; however, at least 75 percent of the distance shall be performed at the vehicle's top speed (sustained). During the T/R test or road test, the contractor shall verify that the vehicle successfully shifts through all forward transmission shift points. The T/R test or road test shall also facilitate speeds up to maximum governed speed (top speed). At the completion of accumulated time or miles, the vehicle shall be stopped and the engine allowed to idle for not less than 5 minutes. At this time a walk-around inspection shall be performed. Transmission, engine oil, radiator fluid, power steering fluid, and hydraulic brake fluid levels shall be re-checked. Failure to operate as prescribed herein; evidence of any deficiency, malfunction, or leakage, the need for service of any component; or loose, disassembled, or broken items that reduce the required vehicle capability shall constitute failure of T/R test or road test.

4.6.8 Control Test. When required by contract, control tests for maintaining and evaluating process control shall be conducted by the contractor as referenced in Table I. This test is performed on selected vehicles after completion of Quality Conformance Inspection.

4.6.8.1 To demonstrate continuous control of manufacturing processes, when required by the contract, control tests shall be conducted by the contractor at the manufacturing facility. The contractor shall conduct all tests specified in Table III, at full payload. All payloads shall be actual or simulated. The test vehicle shall be operated for a minimum of 50 miles (at the sustained top speed) on a hard surface road or test track. After the road test, the vehicle shall be examined for leaks, damage, cracks, and permanent set. For repetitive defects or failures, at the Government's discretion, additional control tests may be required, beyond those identified in Table III, sufficiently to ensure that the defect or failure has been completely eliminated.

4.6.8.2 Failure of Control Test. If the vehicle selected fails to pass any of the control tests, the Government PCO shall stop acceptance, examination and testing on subsequent vehicles until such time as the conditions causing the failure have been remedied. Any defects found during, or as a result of the test, shall be prima facie evidence that vehicles accepted subsequent to the previously acceptable control tests were similarly defective, until the PCO is furnished evidence by the contractor that they are not similarly deficient. Such defects on all vehicles shall be corrected by the contractor at no cost to the Government. Another vehicle with corrective actions implemented shall be subjected to the control test to verify effectiveness of corrective actions.

4.6.9 Follow-on Production Test (FPT). When required by the contract, one production vehicle shall undergo follow-on production testing at a designated government approved test site to evaluate and assess continued conformance to the requirements of Section 3 and production capability, as referenced in Table III. The FPT is test of the end item, similar to PVT, but more limited in scope, to assess continued conformance to requirements and production capability.

4.6.9.1 Test deficiencies. Deficiencies discovered during, or as a result of the FPT, may be cause for rejection of subsequent produced vehicles, until the contractor has provided evidence that corrective action has been taken to eliminate the deficiency. Any deficiency found during, or as a result of the FPT, shall be prima facie evidence that all vehicles currently or subsequently produced are similarly deficient, unless evidence satisfactory to the contracting officer is furnished by the contractor that they are not similarly deficient. The contractor shall correct such deficiencies on all vehicles at no cost to the Government. All corrective actions carried out as a result of the deficiencies found during or as a result of FPT may be successfully demonstrated during a full retest to the portion of the IPT as directed by the Procuring Contracting Officer.

4.6.10 Final Inspection of Production Vehicle(s). Each vehicle shall be inspected by the contractor for the characteristics/defects listed in Table III and the Final Inspection Record (FIR), as a minimum. A final inspection of the end item shall be performed before government acceptance of a production vehicle, utilizing a PCO approved FIR. The FIR is a quality record, which documents all verification actions performed on each production vehicle, for both in-process and final inspections. The FIR provides documented results and corrective action.

4.6.10.1 Unclassified Defects. All defects that have no effect on function, safety, interchangeability, or life, but that are considered departures from good workmanship, will be noted in writing. Workmanship deficiencies falling within this category, and recurring in three consecutive lots, will be added to the minor defects classification list.

4.6.10.2 Recurring Major Deficiencies. A major deficiency (see 6.7.13) is recurring when the same defect occurs more than once in the same sample, or when the defect occurs in two successive samples. A major defect may be considered recurring when the historical inspection records ("P" chart or Government approved equivalent) reflect such a condition. Recurring major deficiencies shall be cause for the entire lot, or lots, to be inspected for the recurring deficiencies. The deficiencies shall be corrected at no cost to the Government by the contractor prior to acceptance by the Government.

4.6.10.3 Recurring Minor Deficiencies. A minor deficiency (see 6.7.13) is recurring if it occurs in three successive samples. Recurring minor deficiencies shall be cause for the entire lot or lots to be inspected for the recurring deficiencies, and correction shall be accomplished at no cost to the Government prior to acceptance by the Government..

TABLE III – Classification of Defects

Defect No.	Defect Characteristic	Method of Inspection
MAJOR		
101	Steering mechanism: malfunction, unusual noise, leak.	Visual, functional
102	Engine: malfunction, unusual noise, leaks, improper installation, low oil level.	Visual, functional
103	Transmission: malfunction, unusual noise, improper shifting, leak.	Visual, functional
104	Drivetrain: malfunction, misalignment, unusual noise, overloaded.	Visual, functional
105	Transfer case assembly: malfunction, improper clearance, leaks, improper installation.	Visual, functional

106	Cooling system and components: malfunction, unusual noise, leaks, improper installation.	Visual, functional
107	Electrical system and components: malfunction, improper voltage and/or amperage	Visual, functional
108	Service, parking brakes: malfunction, unusual noise, pulling to one-side, leaks.	Visual, functional
109	Tires, wheels: damage, not properly inflated, overloaded for payload and speed	Visual, gage
110	Lubrication system components (engine): damage, leakage, improper lubrication, cleanliness.	Visual, functional
111	Fuel tanks and system: welding defects, leakage, cleanliness.	Visual, functional
112	Exhaust system: damage, leaks, excessive noise, improper installation.	Visual, functional
113	Suspension system: malfunction.	Visual, functional
114	Wire rope: malfunction, improper size, damage.	Visual, functional
115	Instrumentation switches: malfunction, location, damage.	Visual, functional
116	Nuclear, biological, chemical: storage mounting provisions.	Visual
117	Weld defects: improper welds.	Visual
118	Glass: not clear, water white or untinted	Visual, functional
119	Vehicle cannot produce power for all communications equipment and electronic countermeasures	Visual, functional
120	Articulating Arm not operating correctly	Functional
121	Cameras and Display Screens inoperable	Visual, functional
MINOR		
201	Coolant: low or improper mixture.	Visual, hydrometer
202	Lubricants: levels and proper types.	Visual
203	Gages and controls: malfunction, adjustments, damage.	Visual, functional
204	Wheels and tires: improper size, type and mounting.	Visual
205	Pulleys and fans: misalignment, improper clearance.	Visual
206	Bolts: defective, loose.	Visual, torque wrench
207	Wiring or tubing: defective, improper assembly or installation, improper protection, improper identification.	Visual
208	Body, doors, access covers, tiedowns, lifting device: improper fit, defective weldment, inadequate seals.	Visual, functional
209	Paint: application, improper color, camouflage pattern, coverage, corrosion.	Visual
210	Lube fittings: defective, missing, improperly installed.	Visual
211	Seats: improper fit, seatbelts not accessible.	Visual
212	Decals, marking, data and instruction plates: incomplete data, missing, improper location or size.	Visual
213	Batteries: malfunction, cracks, improper installation.	Visual, functional
214	Radio Brackets/Connectors: improper installation.	Visual
215	Lights (white and military blackout): improper installation, cracked lenses, malfunction.	Visual, functional
216	Air compressor/pneumatics: improper installation, malfunction, insufficient hose, low pressure, and leaks.	Visual, functional
217	Windows: cracked glass, improper installation, leaks.	Visual, functional
218	Air Transportability: malfunction, leaks-hydraulic/pneumatics, fluid level, improper installation.	Visual, functional
219	Windshield Washers: inoperative, fluid quantity, fluid level.	Visual, functional
220	All other components/characteristics, as required.	Visual, functional

4.7 Materials. To determine conformance to 3.2.1, 3.2.2-3.2.4, the contractor shall provide the government with certification(s) and test results that the materials meet the specified requirements. The Government, during the course of the contract, reserves the right to review contractor's purchase orders, materials, and certifications to determine if the material specifications and quality conform to the specified standard publications.

4.7.1 Corrosion prevention and control. To determine conformance to 3.2.5 the vehicle corrosion prevention design will be evaluated by conducting, at the Government's option, a Government-approved accelerated corrosion durability test at an approved Government test site.

4.7.2 Hazardous Materials. The contractor shall provide certification of conformance to 3.2.1.1. EPA and OSHA certifications of the manufacturing processes and facilities (contractor and subcontractor) are required before the Start of Work meeting. The Government, during the course of the contract, reserves the right to review contractor's purchase orders, materials, and certifications to determine ongoing conformance to 3.2.1.1.

4.7.3 Finish. To determine conformance with 3.2.6, the vehicle shall be checked for proper application of paint in accordance with MIL-DTL-53072. After application of the final coat of paint, the surface shall be checked for smoothness and non-structural surfaces visible during normal operations shall be free of grit, seeds, streaks, runs, sags, wrinkles, pinholes, craters, and nonconformity of specified colors. During production, the contractor shall have documented methods and instructions for In-Process Inspection, to verify cleaning, pre-treating, primer application, and top coat application procedures that conform to the referenced drawing requirements.

4.7.4 Camouflage. To determine conformance to 3.2.7, the vehicle shall be checked for the required three-color camouflage pattern approved by the Government.

4.8 Configuration. To determine conformance to 3.3, the contractor shall provide the government with relevant certification(s) and test results that the vehicle meet the specified requirements.

4.9 Components and Ratings. To determine the conformance to 3.4, the prime contractor shall provide certified system component ratings and design applications on all components to be incorporated into the vehicle in accordance with the solicitation or contract.

4.9.1 Engine. To determine conformance to 3.4.1, the engines shall be checked for malfunction/leaking of coolant, lubricants, and fuel. The engine shall be examined for completeness, proper installation in vehicle, electrical hookups, fuel and air line connections, mechanical control hookups, oil level, fuel consumption, and cooling fluid hookups. The contractor shall certify that the engine has passed the NATO 400-hour standard engine test, AEP-5, and meets performance specifications. If the contractor and engine manufacturer certify the engine has passed commercial tests more strenuous than the NATO 400-hour standard engine test, the NATO 400-hour test certification will not be required, however a copy of the test procedure used to certify the engine will be provided with the certification. The engines shall be in accordance with SAE J1349 when tested. Engines shall demonstrate the ability to operate on all fuels specified in 3.4.1. National Security Exemption documentation shall be provided at the Start of Work meeting.

4.9.2 Engine air-intake. To determine conformance to 3.4.1.1, the air cleaner system shall be checked for proper installation and for proper configuration type (heavy-duty, dry-type). The contractor shall certify that the air cleaner element meets the 200 hour laboratory service life requirements when tested per MIL-PRF-62048.

4.9.3 Dusty Conditions. If the contractor and air cleaner manufacturer certify that the air cleaner, without a kit, has passed testing in accordance with MIL-PRF-62048 with Arizona Test Dust (ISO 12103-1 A1), test results shall be provided.

4.9.4 Cooling system. To determine conformance to 3.4.2, the cooling system shall be tested to assure the vehicle meets cooling system requirements. The cooling system shall be tested for maintaining

the specified component operating temperatures within the specified limits while operating continuously at full load and 0.6 tractive effort to gross vehicle weight ratio (TE/GVW) while under the maximum conditions of 135°F. Test shall be conducted in accordance with TOP 2-2-607 Change 1. During testing, the cooling system must not exceed temperature limits while operating at rated engine power. The cooling system shall be tested and must meet the above requirements after a drawdown of 10% of engine coolant. During cooling system testing, the capability of retention and recovery or expansion reserve capacity shall be checked to the specified requirements. Test reports and material certifications shall be made available to the Government verifying coolant system hoses are silicon type and meet the requirements of A-A-52426. The cooling system shall be checked periodically during testing at a Government proving ground for leakage (no leaks are allowed).

4.9.5 Lubricating Oil(s). To determine conformance to 3.4.3 the vehicle shall be checked for proper lubricant levels in accordance with the lubrication data plate. Contractor shall demonstrate compatibility with specified lubricants.

4.9.6 Hydraulic Fluid(s). To determine conformance to 3.4.3.1 the vehicle shall be checked for proper hydraulic fluid level. Contractor shall demonstrate or provide certification with specified hydraulic fluids.

4.9.7 Fuel tanks. The fuel tank(s) shall be checked to verify that only 95% filling capacity is allowed. During PVT and FPT the vehicle shall also be tested for proper operation with 10% (approximation) fuel remaining. During inspection(s) and testing, compliance with the requirements of 3.4.4 will be determined. The contractor shall certify that the fuel tanks are corrosion resistant and the safety venting system and pressure resistance meets FMCSR 393.67(F).

4.9.8 Reserved.

4.9.9 Exhaust system. To determine conformance to 3.4.5, the contractor shall certify that the vehicle exhaust system conforms to the requirements of FMCSR 393.83. The vehicle shall be checked for proper installation of exhaust system components to preclude exhaust leaks and heat damage. In addition, the vehicle shall be checked for the proper material construction of exhaust system (including muffler and tail pipe). The contractor shall also certify that the design of mounting brackets and fasteners protects against dissimilar metal corrosion.

4.9.10 Transmission. To determine conformance to 3.4.6, the transmission shall be checked for proper type (automatic as defined in SAE J645) and smooth operation/shifting in all gears including reverse. During vehicle road tests, the transmission downshift inhibitor system or automatic system shall be checked for proper operation during each forward gear. The transmission shall be checked for proper installation, oil leaks, and excessive heat during vehicle operation. The contractor shall certify that the transmission conforms to requirement 102 of MIL-STD-1180. During testing at a Government proving ground, all transmission control system requirements shall be tested or checked.

4.9.11 Electrical system. To determine conformance to 3.4.7, the vehicle electrical system during First Production Vehicle Inspection the electrical system shall be tested in accordance to the test methods stated in MIL-STD-1275 in addition to other examinations/tests as required to insure adherence to MIL-STD-1275. The ripple (spikes and surges) tests specified in MIL-STD-1275 shall be conducted simultaneously with a cracking level test. Testing results shall meet the requirements stated in the "Detailed Requirements" of MIL-STD-1275. The contractor shall certify the vehicle electrically meets the requirements of FMCSR 393.27 through System 393.33.

4.9.12 Alternator/Regulator. Compliance with 3.4.7.1 shall be demonstrated during First Production Vehicle Inspection.

4.9.13 Starter. During Quality Conformance Inspection, starter re-engagement and restart requirements shall be tested, and starter shall be inspected to verify proper sealing/venting.

4.9.14 Reserved.

4.9.15 Reserved.

4.9.16 Reserved.

4.9.17 Reserved.

4.9.18 Reserved.

4.9.19 Slaving components. To determine conformance to 3.5, vehicle shall be checked for installation and function of trailer connections. Slave receptacle shall be checked to STANAG 4074. All connectors shall be examined for waterproof design specified. During tests at Government proving ground (see Table II), the vehicle shall be tested for jump start capability with the slave cable and an outside power source.

4.9.20 Reserved.

4.9.21 Reserved.

4.9.22 Reserved.

4.9.23 Lighting. To determine conformance to 3.6, the vehicle lighting system shall be checked for proper operation, installation of the lights and equipment specified, in accordance with applicable referenced standards. During the First Production Vehicle Inspection, the contractor shall certify compliance to FMVSS 108, except for the items in conflict with 3.6.1 – 3.6.5.1.

4.9.24 Headlights. To determine conformance to 3.6.1, the contractor shall provide documentation (either commercial literature or test data) that the provided headlights meet the requirements of 108 and MIL-STD-180, SAE J578 and SAE J1383.

4.9.25 Blackout lights and Crew lighting. To determine conformance to 3.6.2 - 3.6.4, vehicle blackout lighting shall be subjected to tests to validate the stated requirements.

4.9.26 Spotlight and Area Lighting. Compliance with 3.6.5 and 3.6.5.1 shall be demonstrated during First Production Vehicle Inspection.

4.9.27 Reserved.

4.9.28 Wiring. To determine conformance to 3.7 and 3.7.1, vehicle wiring shall be checked to SAE J1128, SAE J1163, and SAE J1292; including minimum wire size.

4.9.29 Battery and Battery mounting. To determine conformance to 3.8 and 3.8.1, the contractor shall certify that the batteries conform to the requirements in SAE J537 and SAE J1127. During the

Quality Conformance Inspection, the batteries, mounting, restraints, cables, and master electric power switch shall be checked for location, condition, proper installation and operation.

4.9.30 Test Equipment. During Control Tests and initial production tests (para 4.3.2), the connector assembly shall be tested to determine proper function and compatibility. The MPCV will be connected to the current U.S. Army Standard Unit Level Test Measurement and Diagnostic Equipment which is presently the MSD (Maintenance Support Device), with the auxiliary MSD-ICE (Internal Combustion Engine) test hardware. A non-destructive fault will be inserted and diagnosed to determine that the vehicle's ECM / ECU diagnostic outputs are transmitted to the vehicle mounted J1939/13 female 9 pin Deutsch connector, using a format conforming to SAE J1587. Failure to diagnose the system fault will constitute failure of this test. Nonconformance or failure of any component that degrades the vehicles diagnostics shall constitute failure of this test.

4.9.31 Reserved.

4.9.32 Vehicle hull or Chassis. To determine conformance to 3.11, the contractor shall provide the government with certification(s) and test results that the vehicle hull or chassis meets the specified requirements. The Government, during the course of the contract, reserves the right to review contractor's purchase orders, materials, and certifications to determine if the vehicle hull or chassis's material and quality conform to the specified standard publications.

4.9.33 Axles and Suspension. To determine conformance to 3.11.1 and 3.11.3, the vehicle suspension and axles shall be checked for proper mounting clearance, lubrication and alignment. The vehicle suspension shall be periodically inspected during Government Proving Ground tests to detect any overstress condition.

4.9.34 Torque limiting differentials. To determine conformance to 3.11.2, the differential shall be checked for proper installation, leaks and excessive heat during operation.

4.9.35 Tires, Wheels and Run-flats. To determine conformance to 3.11.4, the vehicle's wheels, rims, and tires shall be checked for proper type ratings specified. The tires shall be checked for condition, lug nut torque, proper tire pressure, location of tire pressure stencil markings and adequate clearance. Lug nuts shall be checked for commonality across all wheels. Operational requirements shall be demonstrated at Government proving ground. The contractor shall certify that the rim and tire ratings conform to FMVSS 119, 120, and SAE J2014.

4.9.36 Wheel Splash and Stone Throw Protection. To determine conformance to 3.11.4.1, vehicle fenders and inner splash shields shall be checked for specified chain clearance and for maximum practical protection of engine and under hood and under vehicle components from debris. Rear wheel splash and stone throw protection shall be checked for conformance to SAE J682.

4.9.37 Service brakes. To determine conformance to 3.11.5, the vehicle brake system shall be checked for proper location, assembly and configuration of the brake system. Prior to the Start of Work meeting, the contractor shall certify that the brake linings are constructed from non-asbestos materials and the vehicle is in accordance with FMVSS 121.

4.9.38 Air system. Contractor shall perform tests on the air system to verify conformance to SAE J10 and SAE J318 and the performance requirements specified in 3.11.5.1.

4.9.39 Trailer brake provisions. Contractor shall verify conformance to 3.11.5.2 if necessary.

4.9.40 Increased braking ability. Contractor shall verify and demonstrate conformity to 3.11.5.3.

4.9.41 Parking brake. To determine conformance to 3.11.5.4, a vehicle shall be tested on the specified slope, in both an upgrade and downgrade position, with the parking brakes set. The engine shall be operated a minimum of two minutes, and a minimum of one minute with the engine shutdown, in each test position (upgrade and downgrade). There shall be no evidence of slipping during the test. The test shall be conducted on a dry, hard surface slope that is free from loose material. In addition, the proper parking brake application shall be demonstrated (i.e. spring action, or other energy). During testing, the parking brake light shall be checked for presence and proper operation, as specified.

4.9.42 Crew compartment. Contractor shall demonstrate conformance to 3.12-3.12.2.2.

4.9.43 Seating. Contractor shall provide certification and test data that the vehicle seating meets FMVSS 207, 209, 210, and 302. The seating and seatbelts shall be inspected and tested during Government Proving Ground tests to determine mitigation of blast impact to occupants, ability to accommodate a 5th percentile female through a 95th percentile male military personnel in full battle gear.

4.9.44 Glass. Contractor shall provide certification and test data that all automotive glass meets

requirements of 3.12.3. Glass performance shall be inspected and verified in Government Proving Ground tests.

4.9.45 Ventilation System. The vehicle shall be tested for operating effectiveness, efficiency, ease of service, and a complete change of air in accordance with MIL-STD-1472 during testing at a Government Proving Ground.

4.9.46 Ingress/Egress Points. Contractor shall demonstrate conformance to 3.12.5.

4.9.47 Emergency Ingress/Egress. Contractor shall demonstrate conformance to 3.12.5.1.

4.9.48 Storage. Contractor shall demonstrate conformance to 3.12.6-3.12.6.2, which shall be inspected and verified during testing at a Government Proving Grounds.

4.9.49 Towing Points. Contractor shall demonstrate conformance to 3.12.7.

4.9.50 Gauges and instruments. To determine conformance to 3.12.9, vehicle instruments and gauges shall be checked for compliance with the requirements specified.

4.9.51 Cab accessories. To determine conformance to 3.12.10, the cab equipment specified shall be checked for proper installation and function.

4.9.52 Mounting of Communications and Electronic Countermeasures. To determine conformance to 3.12.11-3.12.11.1, the specified equipment will be installed to assure power source and mounting are available for operation of the equipment.

4.9.53 Video Displays & Cameras. Contractor shall demonstrate conformance to or provide certification to 3.12.12-3.12.12.3.

4.9.54 Rifle mounting provisions. To determine conformance to 3.12.13, the rifle mount racks shall be checked for capability to hold four M16A1, M16A2, or M4 rifles, and to determine whether locations hinder operation of the vehicle.

4.9.55 Reserved.

4.9.56 Ancillaries. To determine conformance to 3.12.15, BII equipment, as well as any hand tools or other equipment required to perform operator/crew level maintenance procedures that are not specified shall be checked for proper installation and function.

4.9.57 Articulating Arm. To determine conformance to 3.13-3.13.1, the articulating arm shall be tested during testing at a Government proving ground for the requirements specified.

4.9.58 Vehicle performance characteristics. Contractor shall demonstrate conformance to 3.14, which shall be inspected and verified during testing at a Government Proving Grounds.

4.9.59 Operability. Contractor shall demonstrate conformance to 3.14.1, which shall be inspected and verified during testing at a Government Proving Grounds.

4.9.60 Mobility. The MPCV will be modeled to determine compliance to 3.14.2, results shall be verified during testing at Government Proving Grounds.

4.9.61 Payload. The vehicle shall be tested during PVT to determine conformance to 3.14.2.1

4.9.62 Range. To determine conformance to 3.14.2.2, the vehicle with rated payload shall be operated at the speed specified on integral fuel tanks.

4.9.62 Sustained Convoy Speed. To determine conformance to 3.14.2.3, the vehicle shall be tested in accordance with TOP 2-2-602 paragraph 5.2.1 and TOP 2-2-610 paragraph 5.1.3.1 for achieving and maintaining the specified speeds. Test shall be conducted with the engine fan blocked on. If vehicle fails to achieve compliance with engine fan blocked on, a second test shall be conducted with the engine fan operating normally. Attainment of the minimum grade speeds listed in 3.14.2.5 during either test run shall demonstrate compliance with the requirement.

4.9.63 Reserved.

4.9.64 Gradeability and Stability. To determine conformance to 3.14.2.5, the vehicle shall be tested in accordance with TOP 2-2-602 at rated payload.

4.9.65 Fording. To determine conformance to 3.14.2.6, the vehicle shall be operated without preparation, in 30 inches of fresh or salt water, for at least 15 minutes. Fording for a period of 15 minutes shall not cause engine stall, degradation to vehicle components, need for maintenance actions, nor render the vehicle incapable of performing any operation of this specification. While fording, the engine shall be capable of being restarted when stopped for up to 10 minutes. Seals shall restrict the entrance of foreign matter into bearings, which are exposed to contamination during these operations. Water contamination of bearing lubricants shall not be more than 2.0% by volume. All bearing seals shall restrict the leaking of lubricants from the bearings. Immediately following the fording test, the wheel hubs shall be removed and examined for water or water born contamination. Fluid samples shall be taken from the engine, brake fluid, transmission, transfer transmission, power steering pump, fuel tank(s) and all differentials. Water contamination in excess of 2% by volume from before test samples shall be cause for rejection.

4.9.66 Braking. To determine conformance to 3.14.2.7, service brakes shall be tested for the ability to control and hold the vehicle at GVW, on the maximum specified grade in ascending and descending positions for FPVI, PVT, CT, and FPT inspections and at VCW for QCI testing.. Service brakes shall stop the vehicle as specified in FMVSS 121 for the weight/class of the vehicle. Tests shall be conducted on a dry, hard, approximately level, road surface that is free from loose material. The results of a minimum of three consecutive stopping distances shall be averaged to determine adherence to stopping requirements. During braking tests, the vehicle shall be monitored for excessive pulling to the left or right. Brake light activation and brake light override of emergency flashers shall be checked. During Production Verification Tests and Follow-on Production Tests the vehicle shall be tested according to TOP 2-2-608 for conformance to the test criteria specified therein. All brake testing shall be conducted without the use of engine or transmission retarders.

4.9.67 Overall Width. Contractor shall provide conformance to 3.14.2.8.

4.9.68 Turning Diameter. To determine conformance to 3.14.2.9, the vehicle shall demonstrate turning diameter.

4.9.69 Approach and Departure Angle. To determine conformance to 3.14.2.11 the vehicle shall demonstrate the approach and departure angle.

4.9.70 Interface requirements and Dimensions. To determine conformance to 3.15 and 3.15.1, the vehicle shall be tested for the specified transportability requirements set forth in MIL-STD-209H, MIL-HDBK-1791 and MIL-STD-1366. The vehicle shall be checked for adequacy of tiedowns, lifting eyes, instructions for component removal when required for all modes of transport.

4.9.71 Transportability. To determine conformance to 3.15.2, a vehicle shall be prepared for shipment to verify the times required. Vehicle loading shall be conducted in accordance with the requirements and preparation times specified. The vehicle shall be checked for meeting the requirements of MIL-HDBK-1791 for air transport by various aircraft.

4.9.72 Slinging and Tiedown provisions. To determine conformance to 3.15.2.1, the contractor shall certify that slinging and tiedowns meet the General Requirements (para 4) and Detailed Requirements (para 5) of MIL-STD-209H. During Government testing, slinging and tiedown provisions shall be tested to insure the provisions, including the connecting structural members, meet the requirements of MIL-STD-209H, MIL-STD-814B, and MIL-STD-1791.

4.9.73 Rail Transportability. To determine the conformance to 3.15.2.3, the vehicle shall be subjected to military standard rail impact test in accordance with MIL-STD-810. Prior to the rail impact test, the vehicle shall have been tested to the performance requirements specified in this specification. The vehicle shall be inspected before and after the rail impact test to check for spillage of lubricants, structural damage, and electrical shorts. Performance degradation is considered a deficiency.

4.9.74 Marine Transportability. Contractor shall demonstrate conformance to 3.15.2.4.

4.9.75 Environmental parameters. To determine conformance to 3.17 – 3.17.2, the vehicle shall be tested at the stated temperature ranges for a period of not less than 24 hours per range specified. During testing, the vehicle shall be started and operated at least until the vehicle can be safely shut down without external power sources. As a minimum, the following equipment shall be operated to determine proper operation: Engine, Transmission and Drivetrain Components (inclusive); Winch; Electrical, including Lights; Cooling System; Instruments/Controls.

4.9.76 Rain. The MPCV shall be placed in an environmental control test facility simulating falling rain at a rate not less than 4 in/hr and a wind velocity greater than 30 mph. The chamber temperature need not be controlled but the water temperature shall be maintained at 10 °F less than that of the MPCV interior. The MPCV shall be checked for water intrusion, internally, then started. Failure to operate as prescribed herein, nonconformance to 3.17.3 or 3.4.5, or any accumulation of water greater than 0.15 ounce shall constitute failure of this test.

4.9.77 Fungus. Contractor shall provide certifications that materials used in the construction of the MPCV are fungus inert or have been treated to prevent fungal growth.

4.9.78 Sand/Dust. The MPCV will be tested in accordance with Method 510.4 “Sand and Dust” from MIL-STD-810F for conformance to 3.17.5.

4.9.79 Electromagnetic Environmental Effects (E3). To determine conformance to 3.17.6 (inclusive of all subparagraphs), the vehicle shall be tested to validate the stated requirements, in a series of Government conducted PQT test events (i.e. EMC, Inter-system EMC).

4.9.80 Intra-system Electromagnetic Compatibility (EMC). To determine conformance to 3.17.6.1 and 3.17.6.2, the vehicle and components shall be subjected to tests in accordance with MIL-STD-461E.

4.9.81 Reserved.

4.9.82 Sustainment parameters. Contractor shall demonstrate components desired in 3.18.

4.9.83 Maintainability. To determine conformance to 3.118.1 a Maintenance Ratio (MR) of less than, or equal to, that specified in paragraph 3.18.5, must be demonstrated during PVT. The MR will be calculated using the total cumulative maintenance man-hours, scheduled and unscheduled, divided by the miles. Maintenance induced errors, crew errors and operator/crew inspection times are to be excluded.

4.9.84 Compatibility. Contractor shall demonstrate conformance to 3.18.2.

4.9.85 Ease of maintenance. Contractor shall demonstrate conformance to 3.18.3-3.18.4

4.9.86 Reliability, Availability, and Maintainability (RAM). A reliability verification of the vehicle(s) test performance shall be conducted during Government conducted PVT to verify that the Mean Miles Between Hardware System Abort – Mobility requirements, as specified in 3.18.5-3.18.5.6 and shown in Table I, will be generated, utilizing test data (i.e., Test Incident Reports). The contractor’s utilization of “reliability best practices” such as Physics-based Modeling & Simulation (M&S), laboratory component-level testing, Highly Accelerated Life Testing (HALT), Environmental Stress Screening (ESS), Highly Accelerated Stress Screening, Progressive Assurance (RAM Case), and the establishment of a Reliability Development Growth Test (RDGT) are encouraged since they have been shown to increase the likelihood of test success. The usage of such techniques and shall be reviewed. Where possible data from contractor conducted tests and reliability best practices will be used to verify conformance with this requirement.

4.9.87 Repairability. Contractor shall demonstrate conformance to 3.18.7.

4.9.88 Force Protection. The contractor shall demonstrate compliance to 3.19 (inclusive of all subparagraphs), results shall be verified during testing at Government Proving Grounds.

4.9.89 Electromagnetic Radiation Hazards (EMRADHAZ). The vehicle shall be tested for conformance to 3.19.1.

4.9.90 Hazards of Electromagnetic Radiation to Personnel (HERP). The vehicle shall be tested for conformance to 3.19.1.1.

4.9.91 Hazards of Electromagnetic Radiation to Fuel (HERF). The vehicle shall be tested for conformance to 3.19.2.

4.9.92 Reserved.

4.9.93 Nuclear, biological, and chemical (NBC) contamination. The vehicle shall be tested in accordance with STANAG 4145 and STANAG 4521 to demonstrate conformance to 3.19.3.

4.19.94 Mounting Kit, M100 Decontamination System. The mounting bracket location will be evaluated and coordinated between the Government and Contractor.

4.15.95 Reserved.

4.9.96 System survivability. The contractor shall demonstrate compliance to 3.20-3 (inclusive of all subparagraphs), results shall be verified during testing at Government Proving Grounds.

4.9.97 Welding. To determine conformance to 3.20.4 all welds shall be visually inspected in accordance with Section #6 of AWS D1.1 for steel; AWS D1.2 for aluminum. For the purpose of this contract, weld quality and workmanship shall be verified by qualified inspectors trained to perform the specific functions they are assigned. Acceptable training may be based on a) current or previous certification as an AWS Certified Welding Inspector, or b) an Engineer or technician by formal training or experience, or both, in metals fabrication, inspection and testing, who is competent in the use of weld inspection techniques and equipment. Welds will be checked, at a minimum, prior to and at the completion of testing.

4.9.98 Weld joint design. Contractor shall certify that weld practices for scenarios listed in 3.17.4 are in accordance with the requirements of 3.20.4-3.20.4.1.

4.9.99 Human engineering. To determine conformance to 3.21, the vehicle shall be evaluated for soldier MOS requirements and standards specified. Conformance to requirements shall be demonstrated using a government designated driver. During all Government testing, the vehicle will be evaluated for compliance with MIL-STD-1472.

4.9.100 Night Vision Goggles. The contractor shall demonstrate compliance with 3.21.1.1.

4.9.101 Noise limits. To determine conformance to 3.21.2-3.21.3, the vehicle shall be tested for the noise requirements specified. Exterior noise test procedures shall be in accordance with SAE J366, except vehicle payload shall be 2/3 rated payload and engine exhaust brake shall not be engaged during test. Interior noise test procedures shall be in accordance with SAE J336, except: a) measurements shall be taken at the driver's and each crew member's position, b) cab ventilation fan shall be in operation at its highest speed during testing, and c) vehicle payload shall be 2/3 rated payload.

4.9.102 Accessibility. To determine conformance to 3.21.4 a test shall be conducted at a Government test site during Production Verification Testing.

4.9.103 Safety. To determine conformance to 3.22, vehicle systems and components shall be checked for safety related hazards. Vehicle shall be checked for compliance with applicable safety standards in MIL-STD-1180 (TOP 2.2-508 used as guide). Vehicle shall be checked for proper quantity and location of seat belts.

4.9.104 Fire Safety. To demonstrate conformance to 3.22.1-3.22.5 (inclusive of subparagraphs) the Contractor shall certify that fire systems installed on the vehicle have passed government testing and have integrated into the vehicle to meet the requirements as specified.

4.9.105 Backup alarm. Contractor shall certify compliance with 3.22.6.

4.9.106 Horn. Contractor shall demonstrate compliance with 3.22.7.

4.9.107 Whole Body Vibration. The vehicle shall meet the requirements of MIL-STD-1472 for whole body vibration, during testing.

4.9.108 Marking and Identification. The vehicle shall be checked to ensure that exterior markings are applied in accordance with drawing no. 12422122 for stencils, as denoted in the TDP for body peculiar stencils or nameplates. All stowed items on the vehicle shall be checked for proper identification. To determine conformance to ID plate requirements, the vehicle shall be checked to ensure that the identification plate meets the requirements of 3.20 and MIL-STD-130. The ID plate shall be checked for specified attachment hardware and legibility. All markings shall be checked for adhesion, legibility, paint runs and location.

4.9.109 Safety, instructional, and component identification. Contractor shall certify and demonstrate compliance to 3.24.2.

4.9.110 Military load classification identification. To determine conformance to 3.24.3, the vehicle sign kit inspected in accordance with STANAG 2010 and 2021.

4.9.111 Workmanship. The Buffalo MPCVs shall be visually inspected to ensure proper workmanship and that the vehicle is free of defects, sharp edges, burrs and any other deficiency that exhibits poor quality and poor workmanship. All deficiencies shall be corrected by the contractor prior to acceptance by the Government.

4.9.112 Preparation for Delivery. The Buffalo MPCVs shall be visually and dimensionally inspected to verify conformance to the packaging requirements specified in the contract and the Buffalo MPCV Purchase Description.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature, which may be helpful but is not mandatory.)

6.1 Intended use. The MPCV's are intended to be used by Combat Engineering units to execute a variety of route clearance, and survivability missions. They will be utilized in combat environments and supporting missions requiring personnel protection capabilities.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- c. When a first article is required for inspection and approval, time frame for submission, and the number of units required (see 3.1).
- d. Finish color requirement (see 3.2.6).
- e. When a camouflage pattern is to be applied over the finish coat (see 3.2.7)
- f. When current ARMY TMDE (SPORT or MSD) will not be supplied to the contractor (see 3.15)
- g. When a SINCGARS radio set will not be supplied to the contractor (see 3.15)
- h. When an NBC ensemble will not be supplied to the contractor (see 4.5.11)
- i. Nomenclature, assigned weight classification number and instructions (see 3.19.3)
- j. When testing facilities will be stipulated by the government (see 4.5.1)
- k. Packaging requirements (see 5.1)

6.3 First article. When a first article test and inspection is required, each item to be tested should be a first article production unit. The sample should consist of one or more MPCV's, as specified (see 6.2). The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, tests, approval, and disposal of the sample (see 4.2). Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product that has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is appropriate for the pending contract.

6.4 Camouflage pattern data. The contracting officer will arrange for submission of outline drawings from the contractor; and subsequently provide the contractor with pertinent data, to include camouflage pattern drawings and Data Item Descriptions, as applicable (see 3.2.7).

6.5 Government loaned equipment. When applicable (see 6.2), the contracting officer should arrange to furnish the contractor the property specified in 3.15.

6.6 Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units. They will be accepted at the contracting officer's option, providing measurements fall within specified tolerances, using the conversion tables in FED-STD-376; and all other requirements of this specification are met.

6.7 Definitions. For the purposes of this specification, these subordinate definitions apply. The use of the terms "threshold" or "shall" define a minimum contractual performance requirement. The term "objective" establishes the range or upper bound of desired performance.

6.7.1 Vehicle Curb Weight (VCW). The VCW includes the weight of the vehicle with all accessories, a full complement of fuel, lubricant, and coolant, and weight margins for these included

items (as applicable). The VCW excludes the crew, their personal equipment, water/rations, communication gear, personal weapons or mission equipment and any weight margins associated with these items.

6.7.2 Payload. The payload includes the weight of the crew, passengers, their personal equipment, water/rations, personal weapons and ammunition, communication gear, and mission equipment.

6.7.3 Gross Vehicle Weight (GVW). The GVW includes the VCW, mission equipment, payload, crew, passengers, and weight margins.

6.7.4 Recovered materials. Recovered materials are those materials that have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials.

6.7.5 Dissimilar metals. Metals are considered dissimilar when two specimens in contact with each other promote accelerated galvanic corrosion.

6.7.6 Interchangeable. Interchangeable parts are defined as two or more parts possessing such functional and physical characteristics as to be equivalent in performance and durability, and capable of being exchanged one for the other without alteration of the parts, of mating or adjoining parts, except for adjustment, and without selection for fit or performance.

6.7.7 Fungus-inert. A material that is not a nutrient to fungi is considered fungus-inert.

6.7.8 Essential Function Failure (EFF). An Essential Function Failure (EFF) is defined as an event that results in the loss of or operationally unacceptable degradation in one or more of the essential functions. Table 1 in the Failure Definition and Scoring Criteria (FDSC) describes allowable degradation in essential functions and provides additional clarifications with regard to the scoring of the loss of essential functions.

6.7.9 Uncontrolled safety hazard. Uncontrolled safety hazards may be interpreted as defined in MIL-HDBK-454, Guideline 1, Safety Design Criteria-Personnel Hazards.

6.7.10 Minor failure. A minor failure is defined as any malfunction that can be corrected within 30 minutes by adjustment, repair, or replacement using controls and on-equipment tools or parts. Please review the Failure Definition and Scoring Criteria (FDSC) for further details.

6.7.11 Major failure. A major failure is defined as any malfunction that cannot be corrected within 30 minutes by adjustment, repair, or replacement, using controls and on-equipment tools or parts, and is a malfunction that causes or may cause one or more of the following. Please review the Failure Definition and Scoring Criteria (FDSC) for further details.

- a. Failure to commence operation
- b. Cessation of operation
- c. Degradation of performance below the designated levels
- d. Damage to the system if operation is continued.
- e. Personnel safety hazards.

6.8 Identification of changes. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extent of the changes.

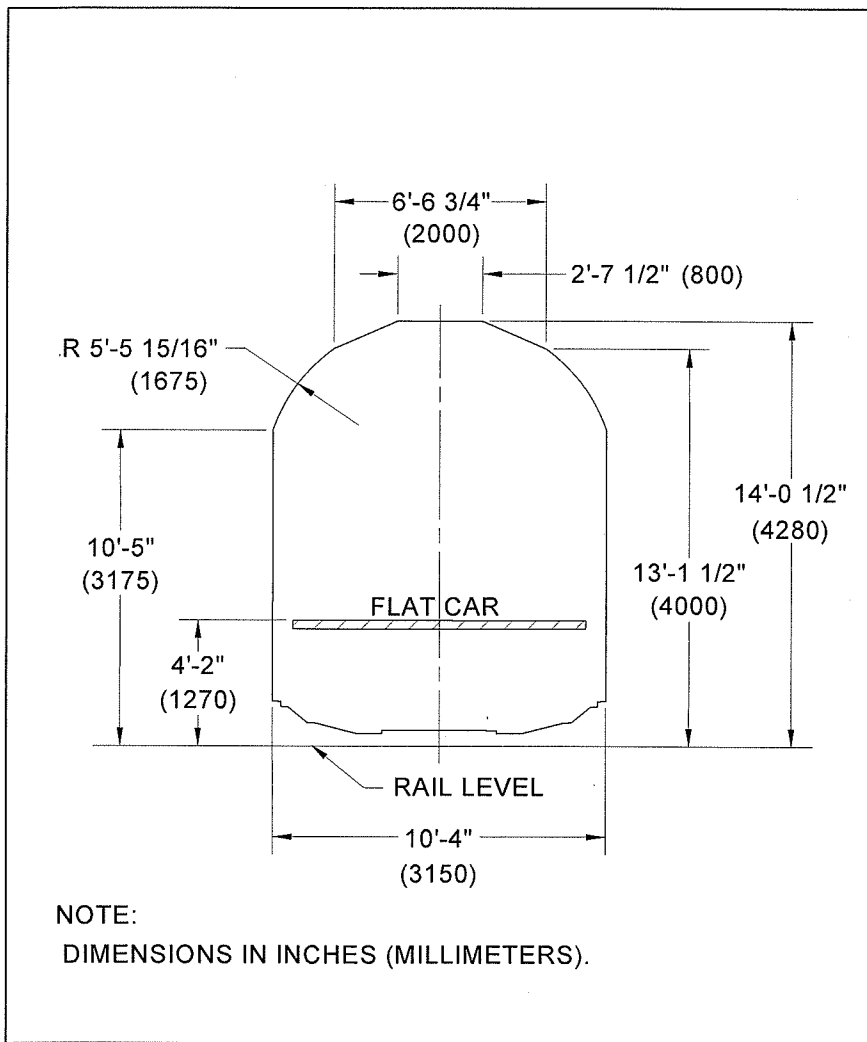


Figure 1. Gabarit International de Chargement (GIC) clearance dimensions.

Custodian:
Army-AT

Preparing activity:
Army-AT